The Impact of the COVID-19 Pandemic

In March 2020, in response to the COVID-19 pandemic public health emergency, then New York State Governor Andrew Cuomo issued executive orders that required most nonessential businesses to close, suspended in-person instruction at public schools and universities, and required residents of New York State to remain home except for essential activities. The governors of New Jersey and Connecticut imposed similar restrictions and consequently, the volume of trips to the Manhattan CBD by all travel modes dropped precipitously.

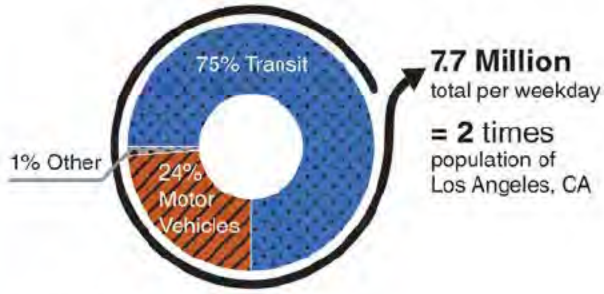
By summer 2021, emergency restrictions were suspended or expired, and many businesses and attractions in the Manhattan CBD reopened. While many office workers continue to work remotely, others have returned to offices or work locations on part-time or full-time schedules.

Weekday MTA subway, bus, and rail ridership remains roughly 35 to 45 percent lower than pre-COVID-19 pandemic levels. However, vehicle crossings at TBTA bridges and tunnels are only about 2 to 3 percent lower than in 2019. As activity is returning to pre-COVID-19 pandemic conditions, so is traffic congestion.

Source
Metropolitan Transportation Authority Day-by-Day Ridership Numbers. https://new.mta.info/coronavirus/ridership

The New York Metropolitan Transportation Council (NYMTC) prepares an annual report on commuting statistics into the Manhattan CBD, known as the *Hub Bound Travel Data Report*. The *Hub Bound Travel Data Report 2019* shows that approximately 7,665,000 people entered and exited the Manhattan CBD on an average weekday, which is about twice the population of Los Angeles, California (**Figure 1-7**).[28] Most (75 percent) of those people entered and exited via transit, but an estimated 1,856,000 (24 percent) people entered and exited by ***[motor]*** vehicle (auto, taxi, van, and truck). NYMTC notes that the daily vehicle trips increased in 2019 compared to 2018.[29] This translates to more vehicles entering and exiting the Manhattan CBD each day than the entire population of Phoenix, Arizona.[30]

Figure 1-7. People Entering Manhattan *[and Exiting]* CBD (by mode)



Source: NYMTC Hub Bound Travel Data Report, 2019

The number of vehicles within the Manhattan CBD builds throughout the day and evening, peaking in the middle of the day and ending in the late-night hours. Between 6:00 a.m. and 10:00 a.m., approximately 40,000 or more private vehicles enter the Manhattan CBD each hour (**Figure 1-8**). While some vehicles leave the Manhattan CBD during that time, they do not offset the accumulation of inbound vehicles. The

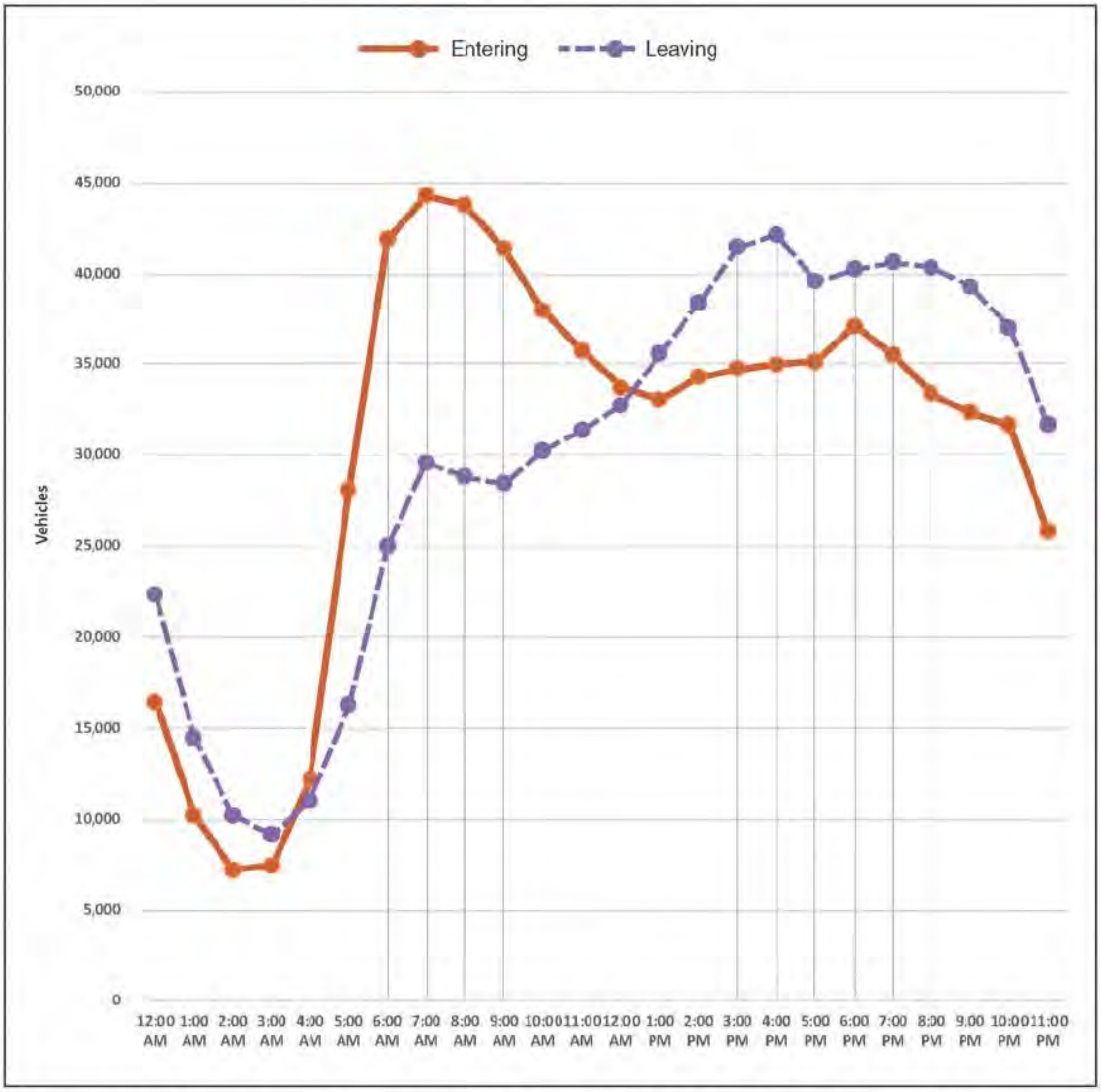
28 As of July 1, 2021, the estimated population of Los Angeles was 3,849,297. U.S. Census Bureau. Quickfacts. https://www.census.gov/quickfacts/fact/table/losangelescitycalifornia,losangelescountycalifornia,CA/PST045221.

29 NYMTC. January 2021. *Hub Bound Travel Data Report 2019.* Transit includes subway, commuter rail, bus, ferry, and tram. NYMTC relies on passenger, vehicle, and bicycle counts to prepare the hub bound data, and these counts include work and nonwork trips. Therefore, percentages of travel by mode vary from census data. https://www.nymtc.org/Portals/0/Pdf/Hub%20Bound/2019%20Hub%20Bound/DM_TDS_Hub_Bound_Travel_2019.pdf?ver=GS5smEoyHSsHsyX_t_Zriw%3d%3d.

30 As of July 1, 2021, the estimated population of Phoenix was 1,624,589. U.S. Census Bureau. Quickfacts. https://www.census.gov/quickfacts/phoenixcityarizona.

trend does not reverse until around 12:00 p.m., when the number of outbound vehicles starts to exceed the number of inbound vehicles, though the variation is much smaller than in the morning.

Figure 1-8. Private Vehicles Entering and Exiting the Manhattan CBD on an Average Weekday



Source: New York Metropolitan Transportation Council. January 2020. *Hub Bound Travel Data Report 2019*.

1.4.1.1 Evidence of Congestion

NYMTC's *Congestion Management Process Status Report* is an annual study of congestion in the New York metropolitan region that reports on the extent of congestion and its effects. The data come from national and local sources and reveal that New York City, and Manhattan in particular, is prone to higher congestion than most urbanized areas in the United States.

One of the well-known ways to demonstrate congestion, used in this report and measured across the country by the Texas A&M Transportation Institute, is the Travel Time Index, which represents the average

additional time required during peak times compared to times of light traffic. If the time required during free-flow travel and peak times is the same, the Travel Time Index value is 1.0. The New York metropolitan region has a Travel Time Index value of 1.35; in essence, it takes 35 percent longer on average to make a trip in the region during peak period than in free-flow conditions.[31]

Despite the reliance on transit, Manhattan still has a much higher Travel Time Index value than the overall metropolitan region: 1.84 in the morning peak period and 2.07 in the evening peak period.[32, 33] For a 20-minute trip in Manhattan, this translates to drivers having to assume it could take more than twice that time on average during the evening hours—this is time wasted on a regular basis because of congestion.

The Travel Time Index helps explain the average changes in travel time resulting from congestion. In the New York metropolitan region, not only is there ongoing, recurrent congestion, but there is also a wide range of variability, especially in congested periods.

Another way to look at congestion is through NYMTC's Travel-Time Reliability indicator. Again, a ratio that is close to 1.0 demonstrates little variability throughout the day and from day to day. A higher number means travel time is more unpredictable, while a lower number means it is more predictable. In Manhattan, the daily level of travel-time reliability for all vehicle modes is 1.65 and for trucks it is 2.67, reflecting widely variable, and therefore unpredictable, travel times.[34]

How Long Will My Trip Take?

When an area is prone to traffic congestion, travelers must add travel time or they risk being late to their destination.

This added time is compounded if the congestion is not just recurring, but also unreliable, with wide variability during the day, and from day to day. Drivers must plan for both regular congestion due to traffic volumes, and for the likelihood that there could be even more congestion as a result of weather, construction, or an incident. This additional time for the trip adds up significantly, especially in Manhattan.

Every day, drivers in Manhattan need to assume that the time they need for what should be a 20-minute trip could take them up to 87.2 minutes.

Source:
New York Metropolitan Transportation Council. September 2021. *2021 Congestion Management Process Status Report.* https://www.nymtc.org/Portals/0/Pdf/CMP%20Status%20Report/2021%20CMP/NYMTC_CMP_Adopted_Report.pdf?ver=gfVbMzvLLqXENvn1jNkOhg%3d%3d

Finally, NYMTC also uses a Planning Time Index that represents the additional amount of time that drivers need to allow to reach their destination under most conditions. In Manhattan, to arrive at a destination on time, drivers regularly need to assume that their trip could take more than four times what it would during free-flow periods.[35]

31 NYMTC. 2021. *Congestion Management Process Status Report*. September 9, 2021. https://www.nymtc.org/Portals/0/Pdf/CMP%20Status%20Report/2021%20CMP/NYMTC_CMP_Adopted_Report.pdf?ver=gfVbMzvLLqXENvn1jNkOhg%3d%3d.

32 Ibid.

33 The Manhattan CBD generates a substantial number of trips to the island and contributes greatly to the overall indicator; thus, it is a useful, if understated, indicator for the Manhattan CBD.

34 NYMTC. September 2021. *2021 Congestion Management Process Status Report*. https://www.nymtc.org/Portals/0/Pdf/CMP%20Status%20Report/2021%20CMP/NYMTC_CMP_Adopted_Report.pdf?ver=gfVbMzvLLqXENvn1jNkOhg%3d%3d.

35 Ibid.

NYCDOT, MTA, and other transportation agencies have implemented programs to increase mobility and improve accessibility in the Manhattan CBD by nonvehicular modes and to reduce vehicular congestion (see **Section 1.1**). Despite these various initiatives that should reduce vehicular traffic in the Manhattan CBD, congestion persists.

The low travel speeds and unreliable travel times to, from, and within the Manhattan CBD increase auto commute times, erode worker productivity, reduce bus and paratransit service quality, raise the cost of deliveries and the overall cost of doing business, and delay emergency vehicles (**Figure 1-9**).

Figure 1-9. Typically Congested Streets in Lower Manhattan During the Evening Rush (Summer 2022)

Source: MTA

1.4.2 The Need to Create a New Local, Recurring Funding Source for MTA's Capital Projects

In the past five decades, state and city officials along with other stakeholder groups have studied various concepts for addressing traffic congestion in the Manhattan CBD. Sustained investment in public transportation is one strategy consistently identified in those studies.

The importance of transit to New York City's overall economy cannot be overstated. As the primary mode of travel to the Manhattan CBD, continued investment in transit is critical to mobility and accessibility of the Manhattan CBD and the region. More than 75 percent of all trips, and 85 percent of commuter trips, into the Manhattan CBD are made by bus, subway, commuter rail, or ferry.[36, 37] MTA subways served 1.7 billion passengers in 2019, and MTA buses carried 677.6 million passengers, providing access to employment, healthcare, education and the full range of services and entertainment options available throughout New York. The 10 busiest subway stations in the MTA system are in the Manhattan CBD, and two of the 10 busiest MTA bus routes are in or serve the Manhattan CBD.[38] LIRR and Metro-North were the busiest commuter rail systems in the United States in terms of average weekday ridership in 2021.[39] MTA alone employs approximately 70,000 people (making it one of the largest individual employers in New

[36] NYMTC. January 2021. *Hub Bound Travel Data Report 2019*. https://www.nymtc.org/Portals/0/Pdf/Hub%20Bound/2019%20Hub%20Bound/DM_TDS_Hub_Bound_Travel_2019.pdf?ver=GS5smEoyHSsHsyX_t_Zriw%3d%3d.

[37] U.S. Census Bureau, 2012–2016 Census Transportation Planning Package.

[38] Metropolitan Transportation Authority Subway and Bus Ridership for 2019. https://new.mta.info/coronavirus/ridership. Bus ridership reflects the total annual reported numbers for New York City Transit and MTA Bus Company.

[39] APTA. "Public Transportation Ridership Report: Fourth Quarter 2021." https://www.apta.com/wp-content/uploads/2021-Q4-Ridership-APTA.pdf.

York State, and larger than the population of many small cities). Through its capital spending, MTA annually injects billions of dollars into the local economy both through major infrastructure projects and day-to-day operations and maintenance programs, indirectly supporting thousands of additional jobs.

Although there was high demand for service, the reliability of MTA's commuter rail, subway, and bus system declined beginning in 2010.[40] MTA documented commuter rail, subway, and bus service delays, which received much public attention.[41] Beginning in 2017, MTA's operating agencies engaged in projects to address some root causes of declining service and implemented improvements to commuter rail and subway infrastructure. As documented in MTA's 2020–2024 Capital Program, these projects resulted in substantial reductions in delay and improvements in on-time performance.[42]

Notwithstanding these improvements, elements of MTA's commuter rail and subway system are more than 100 years old, and essential capital needs remain to ensure a state of good repair and to bring MTA's transit and rail assets into the 21st century. The 2020–2024 Capital Program is intended to "build on these achievements, ensuring that the improvements put in place will be sustainable for years to come."[43] The program identifies $52.0 billion of investments[44] in the region's subways, buses, and commuter railroads. Key tenets of the 2020–2024 Capital Program include the following:

- Investing to improve reliability
- Committing to environmental sustainability
- Building an accessible transit system for all New Yorkers
- Easing congestion and creating growth
- Improving safety and customer service through technology[45]

The continued modernization of MTA's commuter rail, subway, and bus network is necessary to create a faster, more accessible, and more reliable transportation network for the New York City region's residents, commuters, and visitors. The MTA 2020–2024 Capital Program calls for extensive improvements throughout the MTA integrated transportation network. While some capital projects will expand the

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40 MTA New York City Transit. September 23, 2011. *Evaluation of 2010 Service Reductions*. http://web.mta.info/mta/news/books/docs/NYCT_2010_Service_Reduction_Evaluation.pdf.

41 Adrienne LaFrance. July 13, 2017. *The Atlantic*, "The Awful Decline of the New York City Subway System." https://www.theatlantic.com/technology/archive/2017/07/when-did-new-york-citys-subway-get-so-bad/533502/.

42 Metropolitan Transportation Authority (MTA). October 1, 2019. *2020–2024 Capital Program: Executive Summary*. https://new.mta.info/sites/default/files/2019-09/MTA%202020-2024%20Capital%20Program%20-%20Executive%20Summary.pdf.

43 Ibid.

44 This reflects the portion of the capital program that will fund transit improvements; it includes an additional $254 million for other transit projects not identified here, as well as a December 2021 amendment that increased the transit- and rail-related portion of the program by $535 million. The full capital program, including non-transit improvements, includes $55.3 billion in projects.

45 Metropolitan Transportation Authority. October 1, 2019. *2020–2024 Capital Program: Executive Summary*. https://new.mta.info/sites/default/files/2019-09/MTA%202020-2024%20Capital%20Program%20-%20Executive%20Summary.pdf.

system, many others will ensure the long-term viability of current assets to address the deficiencies described previously.

MTA draws funding from several sources. MTA-controlled revenues include commuter rail, subway, and bus fares, and tolls at TBTA crossings; state and local subsidies that include dedicated state taxes (e.g., petroleum business taxes, sales tax, payroll mobility tax, motor vehicle registration and license fees, taxi and FHV fees, real estate transaction taxes on both residential and commercial properties); and station maintenance payments. The Federal government supports MTA transit and commuter capital projects through formula grants, full-funding grant agreements, and other funding programs, primarily through the Federal Transit Administration and the Federal Railroad Administration.

MTA uses these funds to make long-range capital improvements to the system's infrastructure, to expand the system, and to operate its integrated transportation network. However, there is a history of gaps in funding when economic conditions reduce the tax base; when the Federal, state, or local governments reduce subsidies; and when the cost of needed transit improvements exceeds the available funding.

Existing funding sources are insufficient to pay for the transit improvement and modernization projects identified in the MTA 2020–2024 Capital Program and subsequent capital programs that are needed for subway, bus, and commuter rail services. The New York State Legislature passed the MTA Reform and Traffic Mobility Act to provide stable and reliable funding to repair and revitalize the regional transit system.[46]

1.5 PROJECT OBJECTIVES

FHWA and the Project Sponsors have established the following objectives to further refine the Project purpose and address the needs described above:

- Reduce daily vehicle-miles traveled (VMT) within the Manhattan CBD.
- Reduce the number of vehicles entering the Manhattan CBD daily.
- Create a funding source for capital improvements and generate sufficient annual net revenues to fund $15 billion for capital projects for the MTA Capital Program.
- Establish a tolling program consistent with the purposes underlying the New York State legislation entitled the "MTA Reform and Traffic Mobility Act."[47]

46 Consolidated Laws of the State of New York, Vehicle and Traffic, Title 8, Article 44-C Sections 1701 through 1706.

47 Refer to **Appendix 2B, "Project Alternatives: MTA Reform and Traffic Mobility Act."**

1.6 PROJECT SCHEDULE

Table 1-1 shows anticipated milestone dates for Project implementation.

Table 1-1. Project Schedule

ACTIVITY/MILESTONE	ANTICIPATED DATE
Early public engagement*	Fall 2021
Publication of Environmental Assessment (EA)	August 2022
Public review of EA, including public hearing and acceptance of public comments on the EA	August–September 2022
[Ongoing engagement with the Environmental Justice Technical Advisory Group]	***[October 2022–January 2023]***
Federal Highway Administration decision	***[May]*** 2023
Project Implementation	2023

* Refer to **Chapter 18, "Agency Coordination and Public Participation."**

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2. Project Alternatives

2.1 INTRODUCTION

NEPA requires Federal agencies to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."[1] The NEPA regulations promulgated by the Council on Environmental Quality in 2022 at 40 Code of Federal Regulations (CFR) Parts 1500–1508 require that EAs include a discussion of alternatives as required by NEPA (40 CFR Section 1502.14(b)). This chapter describes the previous studies and concepts that were considered prior to 2019 to address congestion in the Manhattan CBD, the preliminary alternatives that FHWA and the Project Sponsors assessed for the CBD Tolling Program (the Project), and the screening evaluation of these preliminary alternatives. Following that discussion, Section 2.4 of this chapter provides information on the two alternatives that are evaluated in detail in this EA: the No Action Alternative and the CBD Tolling Alternative.

2.2 PREVIOUS STUDIES AND CONCEPTS CONSIDERED

For many years, State and City of New York officials and stakeholder and advocacy groups have identified traffic congestion in Manhattan as a concern that adversely affects the economy, environment, quality of life, and public health of New York City and the region. Many of these groups also identified a need for an ongoing, reliable source of funding for MTA. Consequently, there have been a number of studies to identify concepts for addressing the congestion, including introducing tolls. These studies include the following:

- Local congestion management measures as part of New York State's State Implementation Plan to comply with the Federal Clean Air Act (1973), which included tolls on the bridges across the East River and Harlem River to reduce vehicular traffic[2]
- PlaNYC (2007), a long-term plan for New York City proposed by Mayor Bloomberg that included a congestion pricing proposal for the area of Manhattan south of 86th Street[3]
- New York City Traffic Congestion Mitigation Commission Study (2008), which recommended a modified version of the PlaNYC concept, with the northern boundary of the tolling zone at 60th Street so that

1 42 United States Code (USC) 4321 Section 102(E).

2 Plan prepared by then-New York State Governor Nelson Rockefeller and then-New York City Mayor John Lindsay for submission to the U.S. Environmental Protection Agency.

3 The City of New York, Mayor Michael R. Bloomberg. *PlaNYC: A Greener, Greater New York*. April 2007. http://www.nyc.gov/html/planyc/downloads/pdf/publications/full_report_2007.pdf. See p. 88.

the new toll would apply to more intra-Manhattan trips, thereby further reducing congestion and increasing revenue potential[4]

- Move NY Fair Plan (2015), a plan proposed by a citizens' group that involved tolling the area of Manhattan south of 60th Street and adjusting tolls elsewhere in New York City[5]
- Fix NYC Advisory Panel (2018), which recommended a tolling program for the area of Manhattan south of 60th Street as well as other measures to address congestion[6]
- Metropolitan Transportation Sustainability Advisory Workgroup (2018), which focused on actions to improve the region's transportation system, including addressing traffic congestion and identifying sources of sustainable funding for the region's public transit system, and recommended congestion pricing for the area of Manhattan south of 60th Street[7]

Appendix 2A, "Project Alternatives: Previous Studies and Concepts Considered," provides more information on these previous studies.

2.3 PRELIMINARY ALTERNATIVES AND THEIR CONSISTENCY WITH THE PROJECT'S PURPOSE AND OBJECTIVES

FHWA oversees projects throughout the United States that are intended to reduce congestion through "congestion pricing." FHWA's website notes that "Congestion pricing recognizes that trips have different values at different times and places and for different individuals. Faced with premium charges during periods of peak demand, road users are encouraged to eliminate lower-valued trips, take them at a different time, or choose alternative routes or transport modes where available."[8]

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4 The New York City Traffic Congestion Mitigation Commission was a 17-member body appointed by the governor based on recommendations from the New York City mayor and leaders in the New York State Assembly, New York State Senate, and New York City Council. The chair of the commission was Marc V. Shaw, who had previously served as a Deputy Mayor of New York City and Executive Director of MTA. https://www.dot.ny.gov/programs/congestion_mitigation_commission.
New York City Traffic Congestion Mitigation Commission. *Report to the Traffic Congestion Mitigation Commission & Recommended Implementation Plan*. January 31, 2008.
https://www.dot.ny.gov/programs/congestion_mitigation_commission/final-recommendation.

5 Move New York is a coalition of stakeholders representing business associations, trade unions, religious and civic leaders, transportation and environmental advocates, good-governance organizations, and elected officials. The group is led by Alex Matthiessen, president of an environmental consulting firm; Sam Schwartz, PE, the founder of a traffic engineering firm; and Eduardo Castell, a political advisor. Move NY. *Move New York Fair Plan.* February 2015.
[https://www.samschwartz.com/move-ny-fair-plan.]

6 Then-New York State Governor Andrew M. Cuomo created this panel in October 2017, consisting of community representatives, government officials, and business leaders from across the New York City region. Fix NYC Advisory Panel. *Fix NYC Advisory Panel Report.* January 2018. *[https://www.hntb.com/fix-nyc-report/.]*

7 The New York State Legislature created this workgroup, chaired by Kathryn Wylde, President and CEO of the Partnership for New York, and comprising government officials, transportation professionals, and representatives of business and commuter interest groups, as part of the fiscal year 2019 New York State budget. Metropolitan Transportation Sustainability Advisory Workgroup. Metropolitan Transportation Sustainability Advisory Workgroup Report. December 2018.
https://pfnyc.org/wp-content/uploads/2018/12/2018-12-Metropolitan-Transportation-Sustainability-Advisory-Workgroup-Report.pdf.

8 https://ops.fhwa.dot.gov/congestionpricing/index.htm.

Congestion pricing strategies can involve projects that use tolls to manage congestion as well as projects that do not involve tolls. Such strategies include the following:[9]

- **High-Occupancy Toll (HOT) Lanes** involve designating lanes on highways for high-occupancy vehicles only and allowing vehicles with fewer people than required to pay a toll to use the lane. This strategy provides an uncongested alternative for travelers who carpool or pay the toll, and may reduce congestion in the remaining lanes.
- **Express Toll Lanes** are similar to HOT lanes and involve providing a lane designated for vehicles that pay a toll. Tolling is variable to allow effective time-of-day tolling.
- **Pricing on Full Roadways** involves the use of variable tolls on highways, bridges, and/or tunnels to reduce congestion during peak periods.
- **Zone-Based Pricing, including Cordon and Area Pricing** involves either variable or fixed charges to drive within or into a congested area within a city. This type of project has been successfully implemented in London, Stockholm, and Singapore.
- **Regionwide Pricing** involves pricing at several locations in a region.
- **Parking Pricing** consists of parking policies to influence the decision to drive, including variable pricing of curbside parking, commuter parking taxes, and employer incentive programs that offer employees cash rather than the use of employer-provided parking.
- **Priced Vehicle Sharing and Dynamic Ridesharing** involve setting up a ridesharing system, typically by a commercial vendor, to allow customers to use a vehicle only when needed and without owning a car.
- **Pay as You Drive (Making Vehicle Use Costs Variable)** involves a range of different approaches to correlate charges associated with operating a vehicle to the miles driven, thus providing an incentive to drive less.

In consideration of these potential strategies, and in light of the purpose, need, and objectives for this Project, FHWA and the Project Sponsors evaluated the 12 preliminary alternatives described in **Table 2-1**, which included multiple proposals for congestion management described in **Section 2.2** and **Appendix 2A, "Project Alternatives: Previous Studies and Concepts Considered."** One of the alternatives evaluated is the introduction of a vehicular tolling program consistent with the 2019 New York State legislation entitled the MTA Reform and Traffic Mobility Act (Traffic Mobility Act), the program known as the CBD Tolling Program.

9 https://ops.fhwa.dot.gov/congestionpricing/cp_what_is.htm.

Table 2-1. Preliminary Alternatives Considered

TYPE OF ALTERNATIVE	ALTERNATIVE	DESCRIPTION
No Action Alternative Required by NEPA as the benchmark to which the build alternative(s) are compared	NA-1: No Action	The No Action Alternative would not implement a vehicular tolling program to reduce traffic congestion in the Manhattan CBD. The No Action Alternative would not meet the Project purpose and objectives; NEPA regulations require that it be evaluated and serve as the baseline condition against which the potential effects of the build alternative (i.e., the CBD Tolling Alternative) are evaluated. Under the No Action Alternative, existing policies and programs would continue, and planned transportation, policy, and development initiatives that are independent of the CBD Tolling Program would be implemented.
Non-Toll Pricing (NTP) Alternatives Alternatives that use types of pricing mechanisms other than tolling	NTP-1: Parking pricing strategies	This alternative would take one or more of several forms, including elimination of the resident exemption for the parking tax or raising of the tax, increased rates for metered on-street parking, and/or introduction of an overnight on-street parking fee.
Toll (T) Alternatives Alternatives that use different types of tolling mechanisms	T-1: Pricing on full roadways: Raise tolls or implement variable tolls on existing toll facilities	This alternative would raise tolls or implement variable tolls on existing toll facilities.
	T-2: Pricing on full roadways: Toll East and Harlem River bridges	This alternative would establish a toll on the currently untolled East River and Harlem River crossings to Manhattan.
	T-3: High-occupancy toll (HOT) lanes	This alternative would create HOT lanes for passenger cars on major crossings into Manhattan and highways leading to the Manhattan CBD.
	T-4: Zone-based pricing: CBD Tolling Program	This alternative would toll vehicles entering or remaining in the Manhattan CBD, south of and inclusive of 60th Street, excluding the West Side Highway/Route 9A and the Franklin D. Roosevelt (FDR) Drive.
Other (O) Alternatives Alternatives that use methods other than pricing or tolling to reduce congestion	O-1: Parking pricing: Reduce government-issued parking permits	This alternative would reduce the number of permits that provide free on-street parking for government employees commuting to jobs in Manhattan.
	O-2: Provide additional taxi stands to reduce cruising	This alternative would provide additional taxi stands and require that passengers be picked up at designated taxi stands.
	O-3: Create incentives for teleworking	This alternative would create incentives for teleworking to reduce the number of trips made to the Manhattan CBD.
	O-4: Ration license plates	This alternative would prohibit vehicles from entering the Manhattan CBD on certain days based on license plate number.
	O-5: Mandatory carpooling	This alternative would prohibit single-occupant vehicles from entering Manhattan south of 60th Street weekdays, 6 a.m. to 10 a.m.
	O-6: Truck time-of-day restrictions	This alternative would restrict trucks to overnight deliveries.

FHWA and the Project Sponsors used the Project purpose, need, and three of the four objectives presented in Chapter 1, "Introduction," to conduct a screening evaluation of the preliminary alternatives, so as to establish a reasonable range of alternatives for further study, consistent with NEPA requirements. Given the importance of congestion reduction, the first two objectives relate to the need to reduce congestion while the third objective ties to creating a funding source for capital improvements. Together, the objectives used for screening were as follows:

- Objective 1: Reduce daily vehicle-miles traveled (VMT) within the Manhattan CBD.
- Objective 2: Reduce the number of vehicles entering the Manhattan CBD daily.
- Objective 3: Create a funding source for capital improvements and generate sufficient annual net revenues to fund $15 billion for capital projects for the MTA Capital Program.

FHWA and the Project Sponsors did not use the fourth Project goal, "Establish a tolling program consistent with the purposes underlying the New York State legislation entitled the 'MTA Reform and Traffic Mobility Act'" for screening of alternatives.

If, through the screening evaluation, FHWA and the Project Sponsors determined that a preliminary alternative would not meet one or more of the three Project objectives used for screening, they dismissed that alternative from further consideration as an alternative that is not reasonable. As noted in Table 2-2, the Project Sponsors established quantitative criteria consistent with the evaluation results for best-performing options in prior proposals,[10] for determining the consistency of preliminary alternatives with the two congestion-related Project objectives.

- For Objective 1, the evaluation used a reduction of 5 percent relative to the No Action Alternative as the quantitative screening criterion because it represents a meaningful reduction in VMT. Since VMT incorporates the number of vehicles as well as the distance they travel, changes in VMT would be smaller than changes in the number of vehicles.
- For Objective 2, the evaluation used a reduction of 10 percent relative to the No Action Alternative as the quantitative screening criterion because it represents a meaningful reduction in the number of vehicles. As noted, the reduction in the number of vehicles is expected to be larger than the reduction in VMT.

As shown in Table 2-2, and the explanatory notes below it, only Alternative T-4 (Zone-based pricing through the CBD Tolling Program) would meet the purpose for the Project and the screening criteria tied to the objectives. Consequently, Alternative T-4, the CBD Tolling Program, is the only reasonable build alternative and the only build alternative evaluated in detail in this EA.

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[10] See, for example, The City of New York, Mayor Michael R. Bloomberg. *PlaNYC: A Greener, Greater New York*. April 2007. http://www.nyc.gov/html/planyc/downloads/pdf/publications/full_report_2007.pdf and New York City Traffic Congestion Mitigation Commission. *Report to the Traffic Congestion Mitigation Commission & Recommended Implementation Plan*. January 31, 2008.

Table 2-2. Results of Preliminary Alternatives Screening[1]

ALTERNATIVE	PURPOSE AND NEED: Reduce traffic congestion in the Manhattan CBD in a manner that will generate revenue for future transportation improvements	OBJECTIVE 1: Reduce daily VMT within the Manhattan CBD Criterion: Reduce by 5% (relative to No Action)	OBJECTIVE 2: Reduce the number of vehicles entering the Manhattan CBD daily Criterion: Reduce by 10% (relative to No Action)	OBJECTIVE 3: Create a funding source for capital improvements and generate sufficient annual net revenues to fund $15 billion for capital projects for MTA's Capital Program
NA-1: No Action	Does not meet	Does not meet	Does not meet	Does not meet
NTP-1: Parking pricing strategies	Does not meet	Does not meet (see note 2)	Does not meet	Does not meet (see note 2)
T-1: Pricing on full roadways: Raise tolls or implement variable tolls on existing toll facilities	Does not meet	Does not meet (see note 3)	Does not meet (see note 3)	Does not meet
T-2: Pricing on full roadways: Toll East and Harlem River bridges	Does not meet (see note 4)	Meets	Meets	Does not meet (see note 4)
T-3: High-occupancy toll (HOT) lanes	Does not meet (see note 5)	Does not meet	Does not meet	Does not meet (see note 5)
T-4: Zone-based pricing: CBD Tolling Program	Meets	Meets	Meets	Meets
O-1: Parking pricing: Reduce government-issued parking permits	Does not meet	***[Does not meet (see note 6)]***	***[Does not meet (see note 6)]***	Does not meet
O-2: Provide additional taxi stands to reduce cruising	Does not meet	Does not meet (see note ***[7]***)	Does not meet	Does not meet
O-3: Create incentives for teleworking	Does not meet	Does not meet	Does not meet (see note ***[8]***)	Does not meet
O-4: Ration license plates	Does not meet	Meets	Meets	Does not meet
O-5: Mandatory carpooling	Does not meet	Meets	Meets	Does not meet
O-6: Truck time-of-day delivery restrictions	Does not meet	Does not meet (see note ***[9]***)	Does not meet (see note ***[9]***)	Does not meet

Notes for Table 2-2

1 Screening was based on a variety of prior studies and documents, including the following: New York City Traffic Congestion Mitigation Commission, "Congestion Mitigation Strategies: Alternatives to the City's Plan" (December 10, 2007); and "Report to the Traffic Congestion Mitigation Commission & Recommended Implementation Plan" (January 31, 2008), and its appendices, including Cambridge Systematics, Inc., "Technical Memorandum: Telecommuting Incentives," prepared for New York City Economic Development Corporation and New York City Department of Transportation (December 10, 2007); Cambridge Systematics, Inc., "Technical Memorandum: Night Delivery Incentives," prepared for New York City Economic Development Corporation and New York City Department of Transportation (December 10, 2007); Cambridge Systematics, Inc., "Technical Memorandum: Congestion Reduction Policies Involving Taxis," prepared for New York City Economic Development Corporation and New York City Department of Transportation (December 10, 2007); Cambridge Systematics, Inc., "Technical Memorandum: Increase Cost of Parking in the Manhattan Central Business District (CBD)," prepared for New York City Economic Development Corporation and New York City Department of Transportation (December 10, 2007).

2 For NTP-1: ***[Vehicle-miles traveled (***VMT***)]*** reduction was estimated at substantially less than 1 percent. Further, there is no law or agreement in place between the City of New York and MTA that would direct the revenue generated from this alternative to MTA to support the Capital Program.

3 For T-1: This alternative would generate revenue, but the annual net revenues would not be sufficient to fund $15 billion for capital projects for MTA's Capital Program. The revenue as well as reduction in VMT and number of vehicles with this alternative depends on how high the toll is raised and whether tolls are increased only on TBTA facilities or both TBTA and Port Authority of New York and New Jersey facilities. However, with some crossings remaining untolled, traffic would divert to untolled facilities, thereby reducing the revenue and not reducing traffic. Further, this alternative would not target congestion in the Manhattan CBD, given that a number of free entry points to the Manhattan CBD would remain available.

4 For T-2: Earlier studies showed this alternative would reduce congestion and could raise toll revenues equivalent to Project objectives. However, there is no law or agreement in place between the City of New York and MTA that would direct the revenue to MTA to support the Capital Program. ***[In addition, the 2008 New York City Traffic Congestion Mitigation Commission Study identified a number of disadvantages to this alternative, including that this alternative would not address trips that start and end within Manhattan, such as trips beginning or ending on the Upper East Side and Upper West Side; and that this alternative would adversely affect local trips between the South Bronx and Harlem/Washington Heights, which could result in a local adverse economic impact in two environmental justice communities.]***

5 For T-3: HOT Lanes can be effective revenue generators, but their ability to reduce congestion and raise enough revenue to meet the target is limited due to the availability of free lanes on the same highway.

6 ***[For O-1: Earlier studies concluded that reducing parking placards issued to government employees would reduce VMT south of 86th Street by 0.1 to 0.3 percent, depending on the size of the reduction (reductions evaluated ranged from 3,000 to 10,000 placards). With this level of VMT reductions, this alternative also would not reduce the number of vehicles entering the Manhattan CBD enough to meet the Project objective.]***

[7] For O-2: Provision of additional taxi stands would have no effect on the number of taxis entering the Manhattan CBD and would not necessarily reduce VMT since taxis would need to travel back to a taxi stand after discharging customers. Further, this alternative would not broadly address VMT for all vehicles, nor would it reduce the number of vehicles entering the Manhattan CBD.

[8] For O-3: Earlier studies concluded that this alternative would reduce New York City commute trips by less than 2 percent. Recent experience with the COVID-19 pandemic has supported that conclusion. As the region returns to normal business activities, following large-scale, full-time teleworking, many office workers are continuing to telework, but traffic levels are returning to close to pre-COVID-19 pandemic levels (for more information, see **Chapter 1, "Introduction," Section 1.4.1**). With such minimal impact, even combining this alternative with others like NTP-1 or O-2 would not yield congestion reductions and new revenue to meet the Project's purpose, need and objectives.

[9] For O-6: To be successful, truck time-of-day restrictions would require receivers to be open and willing to receive the vehicles in overnight hours. Further, depending upon how the restrictions are implemented, some large trucks might instead send multiple small trucks, thereby increasing vehicle numbers and VMT.

2.4 DESCRIPTION OF ALTERNATIVES STUDIED IN DETAIL IN THIS ENVIRONMENTAL ASSESSMENT

NEPA regulations require that the No Action Alternative be evaluated and serve as the baseline condition against which the potential effects of the build alternative are assessed. Thus, this EA evaluates two alternatives: the No Action Alternative (in which the CBD Tolling Program is not implemented) and the CBD Tolling Alternative (in which a congestion pricing program consistent with the Traffic Mobility Act, the CBD Tolling Program, is implemented).

2.4.1 No Action Alternative

The No Action Alternative would not implement a vehicular tolling program to reduce traffic congestion in the Manhattan CBD.

Under the No Action Alternative, existing policies and programs would continue and proposed initiatives would be implemented. Some of the notable measures include the following:

- The current cap on the number of FHV licenses in New York City would remain in effect.
- The two-way, protected bicycle lanes that NYCDOT implemented in fall 2021 on the Brooklyn Bridge would remain. These bicycle lanes replaced one inbound traffic lane. With the bicycle lanes in place, the upper-level shared-use path would be only for pedestrian use.[11]
- At the Ed Koch Queensboro Bridge, NYCDOT would convert a traffic lane to a pedestrian walkway on the bridge's lower level, and the existing shared-use path on the north side of the lower level would be only for bicycle use.
- NYCDOT would continue the configuration it implemented in August 2021 for the Brooklyn-Queens Expressway, which reduced the highway from three lanes to two lanes in each direction between Atlantic Avenue and the Brooklyn Bridge, and would initiate repairs to the roadway's bridges and structures between Atlantic Avenue and Sands Street.[12]
- The Port Authority of New York and New Jersey (PANYNJ) would implement "open-road" cashless tolling at the George Washington Bridge and Lincoln Tunnel, in which tolls are collected using overhead readers, with no toll booths or attendants.
- MTA would continue to implement transit improvement projects in its 2020–2024 Capital Program, based on the amount of funding available.
- NYCDOT and other New York City agencies would continue programs established as part of the public response to the COVID-19 pandemic to improve accessibility to open spaces. This includes the closure of certain sections of streets to vehicular traffic ("Open Streets") and the use of curbside parking lanes for outdoor dining ("Open Restaurants").

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11 The travel demand modeling conducted for this EA and described in Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling," included the bicycle lanes as part of the No Action Alternative but not the existing condition.

12 Ibid.

- NYCDOT would continue to develop bicycle and bus infrastructure including new bicycle and bus lanes.[13]

With the No Action Alternative, existing tolls at bridges and tunnels connecting to Manhattan that are managed by TBTA and the PANYNJ would remain in effect. (See **Chapter 4, "Transportation," Section 4.1** for more information on current tolls.) In the No Action Alternative, East River and Harlem River crossings—most of which are under the control of NYCDOT—would remain untolled.

2.4.2 CBD Tolling Alternative

2.4.2.1 Overview

The CBD Tolling Alternative would implement a vehicular tolling program to reduce traffic congestion in the Manhattan CBD, consistent with the Traffic Mobility Act.[14] After covering Project-related capital and operating expenses, the revenue collected would fund projects in the MTA 2020–2024 Capital Program and successor capital programs.

The Manhattan CBD consists of the geographic area of Manhattan south and inclusive of 60th Street, but not including Franklin D. Roosevelt Drive (FDR Drive), West Side Highway/Route 9A, the Battery Park Underpass, and any surface roadway portion of the Hugh L. Carey Tunnel connecting to West Street (the West Side Highway/Route 9A). With the CBD Tolling Alternative, TBTA would toll vehicles entering or remaining in the Manhattan CBD via a cashless tolling system. The toll would apply to all registered vehicles (i.e., those with license plates) with the exception of qualifying vehicles transporting persons with disabilities and qualifying authorized emergency vehicles.[15, 16] Passenger vehicles would be tolled no more than once a day.[17] Vehicles that "remain" in the Manhattan CBD are vehicles that are detected when leaving, but were not detected entering in the same day. Given that they were detected leaving, they must have driven through the Manhattan CBD to get to the detection point, and therefore "remained" in it during a portion of the day. These vehicles would be charged that day for remaining in the Manhattan CBD.

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13 New bicycle lanes and bus lanes were incorporated in the transportation modeling conducted for this EA and described in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** as appropriate.

14 The Traffic Mobility Act amended portions of certain New York State laws, including the Vehicle and Traffic Law, the Public Authorities Law, and the Tax Law. **Appendix 2B, "Project Alternatives: MTA Reform and Traffic Mobility Act,"** provides the amended text of those laws.

15 Qualifying authorized emergency vehicle is defined in Consolidated Laws of the State of New York, Vehicle and Traffic Law, Title 1, Article 1 Section 101. As currently *[defined]*, qualifying vehicles transporting persons with disabilities include vehicles with government-issued disability license plates and fleet vehicles owned or operated by organizations and used exclusively to provide transportation to people with disabilities.

16 The toll would not apply to vehicles that are not subject to registration requirements, such as bicycles, electric scooters, bicycles with electric assist ("e-bikes").

17 Passenger vehicle is defined by Consolidated Laws of the State of New York, Vehicle and Traffic Law, Title 4, Article 14 Section 401(6).

Examples of how tolls would be applied for passenger vehicles include the following:

- If a passenger vehicle enters the Manhattan CBD on Monday morning and leaves Monday evening prior to midnight, it would be detected when it enters and when it leaves the Manhattan CBD. Because passenger vehicles would be charged only once daily, a single toll would be charged.
- If a passenger vehicle enters the Manhattan CBD on Monday and is parked until it leaves on Wednesday, it would be charged upon entering on Monday and for remaining when it drove through the Manhattan CBD on Wednesday to leave. This vehicle would not be charged when it was parked the full 24-hour period on Tuesday.
- If a passenger vehicle makes two round trips into the Manhattan CBD on the same day, it would be charged a single toll, because passenger vehicles would be charged only once daily.
- If a passenger vehicle is parked all week within the Manhattan CBD (for example, a vehicle owned by a resident of the Manhattan CBD) and then leaves the Manhattan CBD for a day trip on Saturday, the vehicle would be detected leaving (remaining) and re-entering the Manhattan CBD on the same day. Because passenger vehicles would be charged only once daily, a single toll would be charged on Saturday.
- If a passenger vehicle is parked all week within the Manhattan CBD (for example, a vehicle owned by a resident of the Manhattan CBD or a visitor to the Manhattan CBD) and then leaves the Manhattan CBD on Friday and returns on Monday, the vehicle would be identified as having remained on Friday since it was detected leaving; it would be identified as entering when it returns on Monday. It would receive a charge on Friday for remaining and on Monday for entering the Manhattan CBD. It would not be charged any other days when parked the entire day in the Manhattan CBD, nor the days when away.

Residents whose primary residence is inside the Manhattan CBD and whose New York adjusted gross income for the taxable year is less than $60,000 would be entitled to a New York State tax credit equal to the aggregate amount of Manhattan CBD tolls paid during the taxable year.[18] Residents of the Manhattan CBD with New York adjusted gross income of $60,000 or higher would not be eligible for the tax credit.

The toll amount would vary by time of day, with higher tolls charged during peak periods when congestion is greater. The specific amounts of the tolls have not yet been determined, as discussed later in this chapter. In addition, certain types of vehicles would be exempt from the toll, and some vehicles that already pay tolls on crossings to and from the Manhattan CBD could receive crossing credits.

Consistent with the Traffic Mobility Act, the annual net revenues from the CBD Tolling Program would be sufficient to support a $15 billion investment in the MTA Capital Program. MTA would use the net revenue

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18 Consolidated Laws of the State of New York, Tax Law, Article 22, Section 606 (jjj).

generated by the CBD Tolling Program to fund transit and commuter rail projects in the MTA 2020–2024 Capital Program and successor programs.[19] The funds would be allocated as follows:

- 80 percent to New York City subways and buses (New York City Transit, Staten Island Rapid Transit Operating Authority, and MTA Bus Company)
- 10 percent to Metro-North Railroad
- 10 percent to Long Island Rail Road

The MTA Capital Program is the culmination of MTA's regular evaluation of the condition of its assets and its analysis of regional transportation needs and future travel demands. These assessments support the long-range capital planning process and lead to investment strategies that address safety, state of good repair, and capacity needs. Investments in MTA's integrated transportation network would improve system reliability and accessibility, which would in turn attract new riders and further reduce vehicle demand for road capacity in and connecting to the Manhattan CBD.

To help define the CBD Tolling Program, the Traffic Mobility Act requires the TBTA Board to establish a Traffic Mobility Review Board with six members representing the region who have experience in public finance, transportation, mass transit, or management. The Traffic Mobility Review Board would recommend to the TBTA Board the toll amounts and toll structure, such as crossing credits, discounts, and/or exemptions for existing tolls paid on bridges and tunnels.[20] The variable pricing structure could vary by time of day, day of week, and day of year and could be different for different types of vehicles. Informed by the Traffic Mobility Review Board 's recommendation, the TBTA Board would approve and adopt a final toll structure following a public hearing in accordance with the State Administrative Procedure Act. The adopted TBTA plan would specify any crossing credits, discounts, and/or exemptions for tolls paid on bridges and tunnels; credits, discounts, and/or exemptions for taxis and/or FHVs, which are already subject to surcharges pursuant to the Public Authorities Law; and any other additional potential crossing credits, discounts, and/or exemptions.[21]

The Traffic Mobility Review Board's recommendation would be informed by the results of this EA *[, which includes]* a traffic study, and would consider such factors as traffic patterns, operating costs, public impact, and environmental impacts, including, but not limited to, air quality and emissions trends. The analysis in this EA is intended to identify the potential effects that may result from implementing the CBD Tolling Alternative, including any potential crossing credits, discounts, and/or exemptions. Therefore, this EA considers a range of tolling scenarios with different attributes to identify the range of effects that may occur.

Following implementation of the Manhattan CBD toll, the City of New York would prepare a study of the effects of the CBD Tolling Program on parking within and around the Manhattan CBD. Consistent with the

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19 Net revenue refers to the balance of tolls, fees, and other revenues derived from the CBD Tolling Program, after payment of operating, administration, and other necessary expenses of TBTA, that are properly allocable to the CBD Tolling Program.

20 In April 2018 the State of New York imposed a congestion surcharge on taxis and FHV trips that begin in, end in, or pass through Manhattan south of 96th Street. The Traffic Mobility Act requires the Traffic Mobility Review Board to examine potential CBD toll crossing credits, discounts, or exemptions for taxis and FHVs. The travel demand modeling conducted for this EA assumes that the taxi and FHV surcharge established by 2018 legislation will remain in effect with the CBD Tolling Alternative.

21 Consolidated Laws of the State of New York, Public Authorities Law, Article 5, Title 11 Section 1270-i.

Traffic Mobility Act, this study must be completed 18 months after toll collection commences. In addition, following implementation of the CBD Tolling Program, TBTA, in consultation with NYCDOT, would report on the effects of the CBD Tolling Program on traffic operations, taxi and FHV usage, mass transit usage, and air quality. TBTA and NYCDOT would report on these effects one year after tolling implementation and every two years thereafter.

2.4.2.2 Tolling Infrastructure and Tolling System Equipment

The CBD Tolling Alternative would include tolling infrastructure and tolling system equipment to detect vehicles. This would include poles and mast arms, similar to those used for streetlights and traffic lights today; tolling system equipment housed in enclosures; and signage similar in size and character to signs already present throughout Manhattan. Tolling system equipment would include reader and meter cabinets and cameras. Consistent with the Traffic Mobility Act, TBTA and NYCDOT have entered into a Memorandum of Understanding for coordinating the planning and design and, should the CBD Tolling Alternative be selected, the installation, construction, and maintenance of the Project's tolling infrastructure, including signage (see **Appendix 2C, "Project Alternatives: Memorandum of Understanding Between TBTA and NYCDOT"**). The following sections describe proposed locations for the tolling infrastructure and tolling system equipment and the types of infrastructure and equipment.

<u>Location of Tolling Infrastructure and Tolling System Equipment</u>

The new tolling system would include detection points to identify all vehicles entering or leaving the Manhattan CBD as well as verification points at certain locations along the West Side Highway/Route 9A and the FDR Drive.[22] The poles for the CBD Tolling Alternative would be within the existing transportation right-of-way and would typically be at locations where standard poles are currently installed or would replace existing poles with new poles that are up to about 20 feet from the existing poles. In some locations, new poles would be installed where no poles currently exist. Where appropriate, tolling system equipment would be mounted on existing infrastructure (e.g., under pedestrian walkways and existing overhead sign infrastructure). At the Hugh L. Carey Tunnel and Queens-Midtown Tunnel, the existing tolling equipment would be used.

Based on preliminary design, tolling infrastructure and tolling system equipment would be installed at the following locations, with a total of 120 detection points:

- Near the 60th Street boundary to the Manhattan CBD, generally between 60th and 61st Streets, on all southbound and northbound roadways. This would include detection points close to 59th Street on the three access roads in Central Park that connect to 59th Street (Central Park South).
- At the exits from and entrances to all East River bridges (Brooklyn Bridge, Manhattan Bridge, Williamsburg Bridge, Ed Koch Queensboro Bridge, other than the ramp to 62nd Street) and tunnels under the jurisdiction of the PANYNJ (the Holland and Lincoln Tunnels) that connect to the Manhattan

[22] Tolls would be charged for entering or remaining in the Manhattan CBD; detection points at exit locations would aid in identifying vehicles that have remained in the Manhattan CBD. Verification points along the West Side Highway/Route 9A and FDR Drive would be used to ensure that vehicles that remain on these roadways without entering the Manhattan CBD do not pay a toll.

CBD. This would include detection points on the ramps leading to and from the bridges and tunnels as well as detection points on the East River bridge structures over land. At the TBTA tunnels that connect to the Manhattan CBD (Hugh L. Carey Tunnel and Queens-Midtown Tunnel), existing open-road tolling infrastructure would be used.

- Along the FDR Drive and the West Side Highway/Route 9A to identify vehicles that travel along those routes without entering the Manhattan CBD. These highway detection points would also aid in identifying vehicles that travel to locations on the east side of the FDR Drive (e.g., the Waterside apartment complex) and on the west side of the West Side Highway/Route 9A (e.g., Battery Park City or Hudson River Park) so that those vehicles are tolled.

Figure 2-1 illustrates the general locations where vehicles would pay the toll. Figure 2-2a through Figure 2-2j show in more detail the specific locations proposed for tolling infrastructure and tolling system equipment based on the preliminary design.

Types of Tolling Infrastructure and Tolling System Equipment

At each detection point, cameras and E-ZPass readers would be installed on tolling infrastructure in an arrangement that would allow capture of vehicle information from all traffic lanes. The proposed tolling system equipment would be clustered into single enclosures to reduce its visual impact. These enclosures would house the license plate reader cameras, illuminators, and antenna in a single unit comparable in size and mass to traffic control devices currently used throughout the area of visual effect. The cameras included in the array of tolling system equipment would use infrared illumination at night to allow images of license plates to be collected without the need for visible light.

Different tolling infrastructure would be used, depending on location, to minimize the Project footprint and reflect the existing setting. Based on preliminary design, this would include the following:

- **Modified NYCDOT M-2A poles at the curbside.** NYCDOT uses octagonal poles (M-2A poles) throughout New York City for traffic signals and streetlights. The CBD Tolling Alternative would install new poles that are similar in appearance to standard M-2A poles but would be larger in diameter (potentially up to 14 inches in diameter rather than 8.5 inches) to meet the critical structural performance requirements for mast-arm configurations. The modified M-2A poles would have larger foundations than a standard M-2A pole. From these poles, a new mast arm (similar to the mast arms that support traffic signals throughout New York City) would extend 20 to 50 feet over the roadway with tolling system equipment mounted on it. If an existing pole also supports a streetlight, then a streetlight would be provided on the replacement pole as well. The tolling system equipment mounted on mast arms would collect vehicle information from multiple lanes beneath the mast arm.
- **"Side fires" at the curbside.** In certain locations, tolling system equipment would be mounted on a standard M2-A pole without a mast arm, referred to as a "side fire." The side-fire equipment would collect vehicle information from a single lane. Typically, this would occur at locations where a mast arm would be on one side of the street and a side fire on the other side of the street to allow full coverage of all lanes of the street.

Figure 2-1. General Locations of New Tolls for Vehicles Accessing the Manhattan CBD

Source: Department of Information Technology & Telecommunications. NYC Open Data, NYC Planimetrics. https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d.

Figure 2-2a. Proposed Location of Tolling Infrastructure and Tolling System Equipment: Key Map

Sources: NYC Open Data, NYC Planimetrics, https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d; New York City Department of City Planning, BYTES of the BIG APPLE, https://www1.nyc.gov/site/planning/data-maps/open-data.page; ArcGIS Online, https://www.arcgis.com/index.html.

DOT_0036276

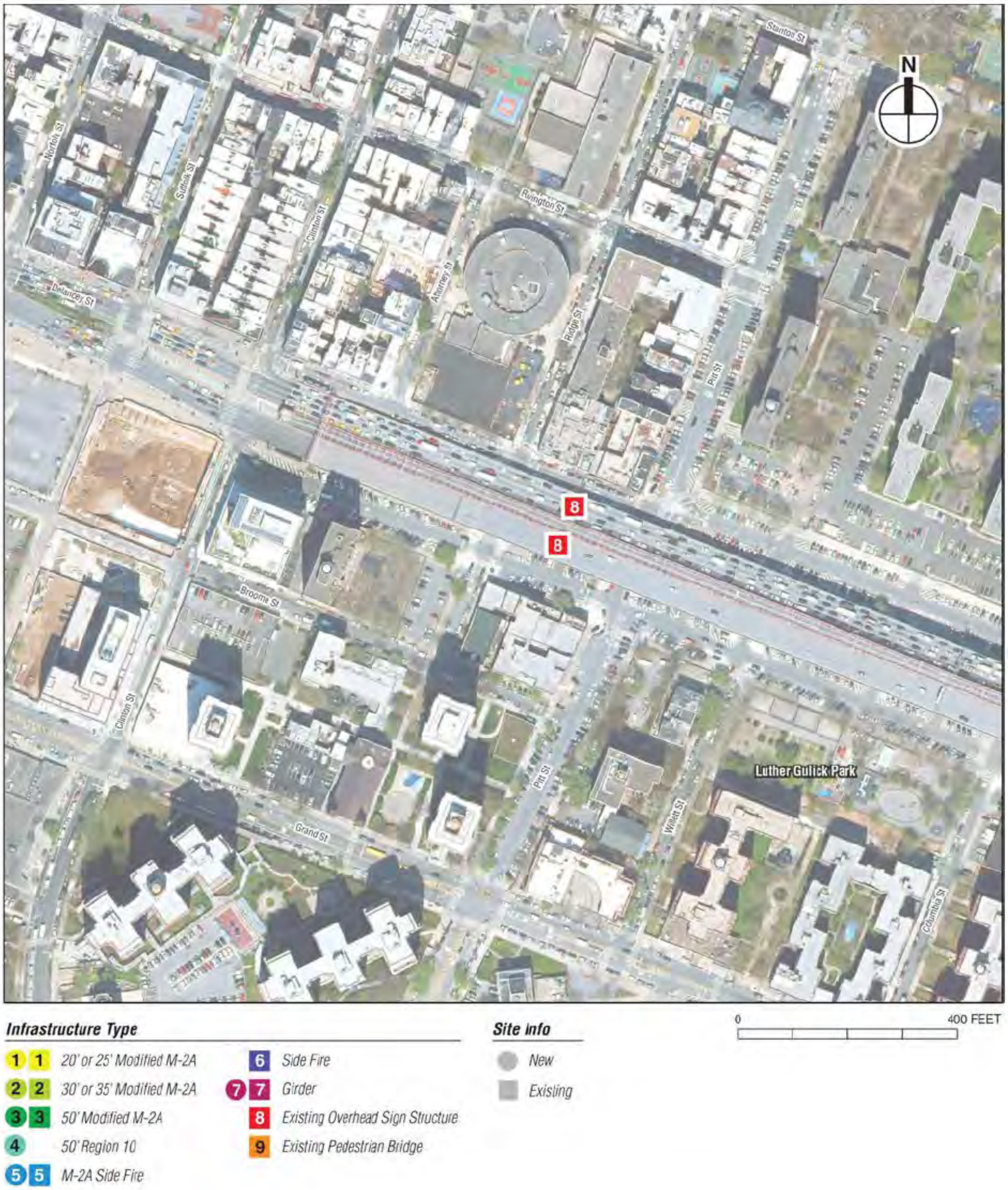
Figure 2-2b. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: West Side Highway/Route 9A and FDR Drive

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 2-2c. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Ed Koch Queensboro Bridge

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 2-2d. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Williamsburg Bridge

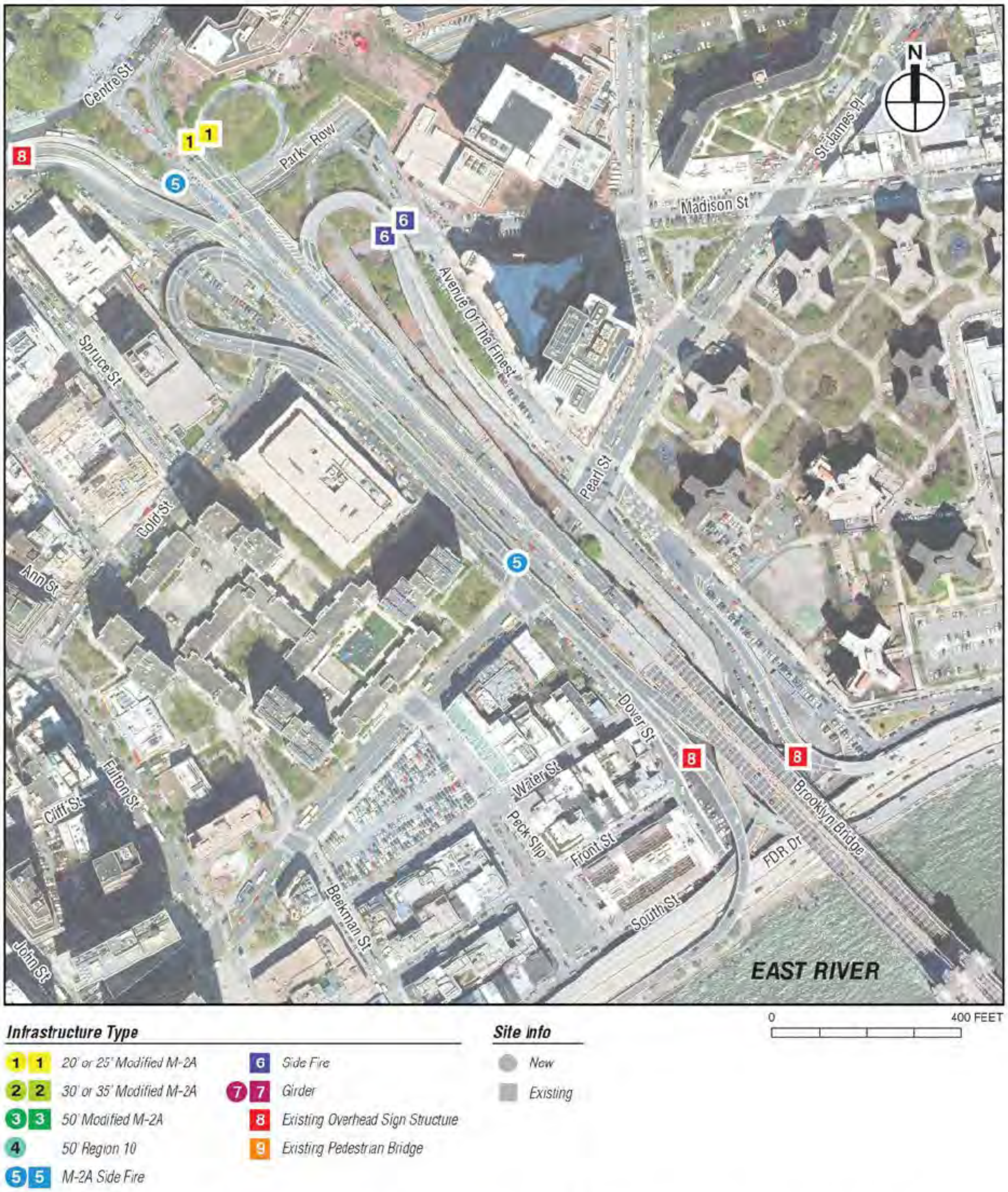


Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 2-2e. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Manhattan Bridge

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 2-2f. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Brooklyn Bridge

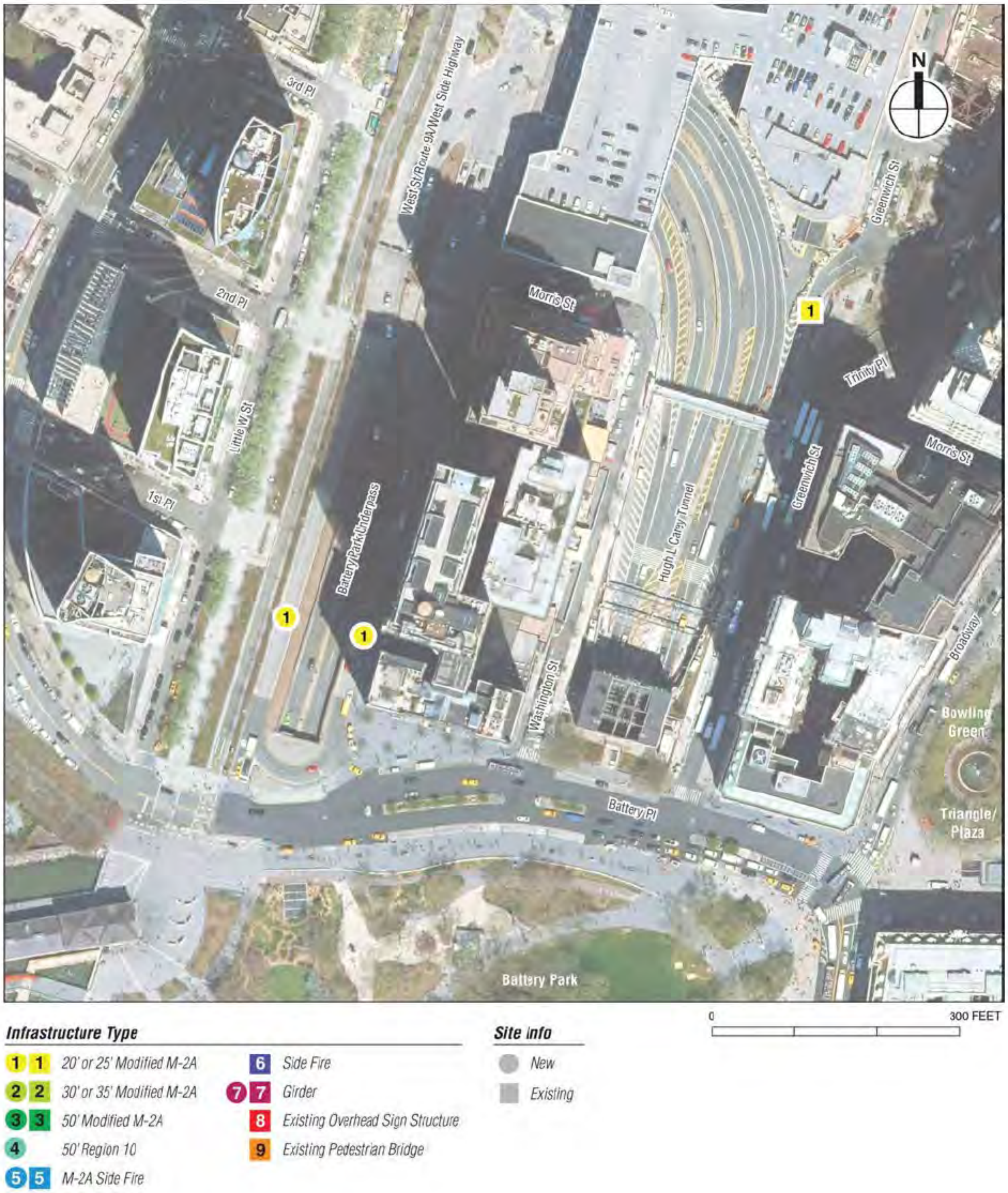


Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 2-2g. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Holland Tunnel

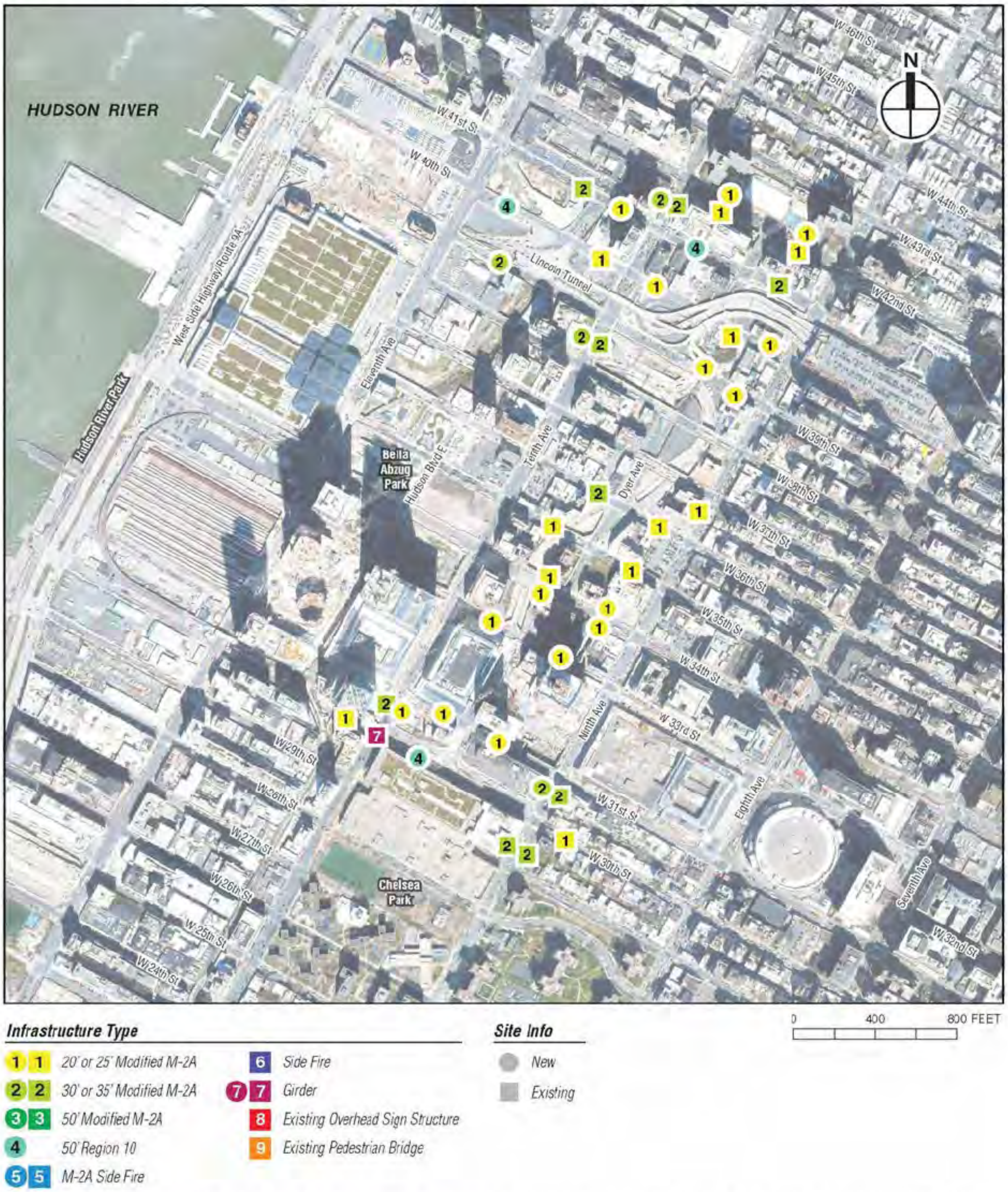
Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 2-2h. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Battery Park Underpass and Hugh L. Carey Tunnel



Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 2-2i. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Lincoln Tunnel



Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 2-2j. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: 60th Street

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000–2018. http://gis.ny.gov/gateway/mg/index.html.

- **Equipment mounted on existing overhead sign structures and pedestrian bridges.** Along the West Side Highway/Route 9A and the FDR Drive, detection points would be mounted on existing overhead sign structures and pedestrian bridges. Some overhead structures would be strengthened to carry the additional load.
- **Equipment mounted on existing bridge and tunnel structures.** On the Brooklyn Bridge, Manhattan Bridge, Williamsburg Bridge, and Ed Koch Queensboro Bridge, and potentially at the Lincoln and Holland Tunnels, tolling system equipment would be mounted to existing overhead sign structures and/or existing structural elements (e.g., girders, walls) of the structures. In addition, on the Manhattan Bridge, a new overhead steel girder that supports the tolling system equipment would span two existing bridge columns to support tolling system equipment above the inner roadway lanes, while poles and mast arms would capture traffic on the outer roadways. Tolling infrastructure and tolling system equipment would also be mounted directly on the structural elements of the Ed Koch Queensboro Bridge and could also be mounted on structural elements at the Lincoln Tunnel. At the Brooklyn Bridge, two replacement poles and one new pole would be installed close to, but not on, the bridge structure.
- **Existing open-road tolling equipment at TBTA tunnels.** At the TBTA tunnels that connect to the Manhattan CBD (Hugh L. Carey Tunnel and Queens-Midtown Tunnel), existing open-road tolling infrastructure would be used.
- **Portable equipment mounted on movable trailers.** This equipment, potentially up to 70 square feet in size, could be parked in the curb lane at detection points to supplement the permanent detection equipment if needed on a temporary basis. It would include an emergency generator to provide power to the equipment.

The tolling infrastructure and tolling system equipment would use existing or new underground connections to utility and communications networks to receive power and system connectivity.

The Project Sponsors are coordinating with PANYNJ regarding potential use of property controlled by PANYNJ associated with the Lincoln and Holland Tunnels for tolling infrastructure and tolling system equipment. This would allow the Project Sponsors to eliminate several detection points on local streets near the Lincoln and Holland Tunnels. This EA evaluates detector point locations on local streets near the Lincoln and Holland Tunnels as well as on PANYNJ property.

The tolling infrastructure and tolling system equipment have been designed to minimize their visual impact, by using existing infrastructure as much as possible and coordinating the appearance of new infrastructure and equipment with the existing street furniture palette. The color of poles, cabinets, and tolling system equipment would be consistent and would match existing light pole colors. Supports, fasteners, and other hardware would also be designed to be minimally visible. In all cases, the Project Sponsors would avoid the removal of street trees for pole placement to the maximum extent feasible and practicable. In addition, the Project Sponsors have selected locations for the tolling infrastructure and tolling system equipment to minimize their potential for adverse effect on nearby historic properties, including the bridges and tunnels that connect to the Manhattan CBD. **Figure 2-3** illustrates the proposed tolling infrastructure and tolling

system equipment. In addition, illustrations in **Appendix 9, "Visual Resources,"** provide comparison views for the No Action Alternative and CBD Tolling Alternative in selected locations proposed for new tolling infrastructure, tolling system equipment, and tolling signage.

Signage

In addition to the tolling infrastructure and tolling system equipment, the CBD Tolling Alternative would include signage on local streets outside the Manhattan CBD to advise drivers of the toll before they enter the Manhattan CBD, and within the Manhattan CBD to advise drivers before they exit the zone. These signs would be similar in size and nature to existing signs already in place and would be mounted on standard signposts on local streets and on existing infrastructure where feasible.

The type, sequence, and quantity of signs would differ depending on the location. **Appendix 2D, "Project Alternatives: CBD Tolling Program Signage,"** provides maps illustrating potential locations for signage and depictions of the types of signs, based on preliminary design. This information would be further refined during, and additional signs or signs in different locations may be required as a result of, final design.

The following text describes the signage that would be included with the CBD Tolling Alternative, based on location (see **Appendix 2D, Figure 2D**):

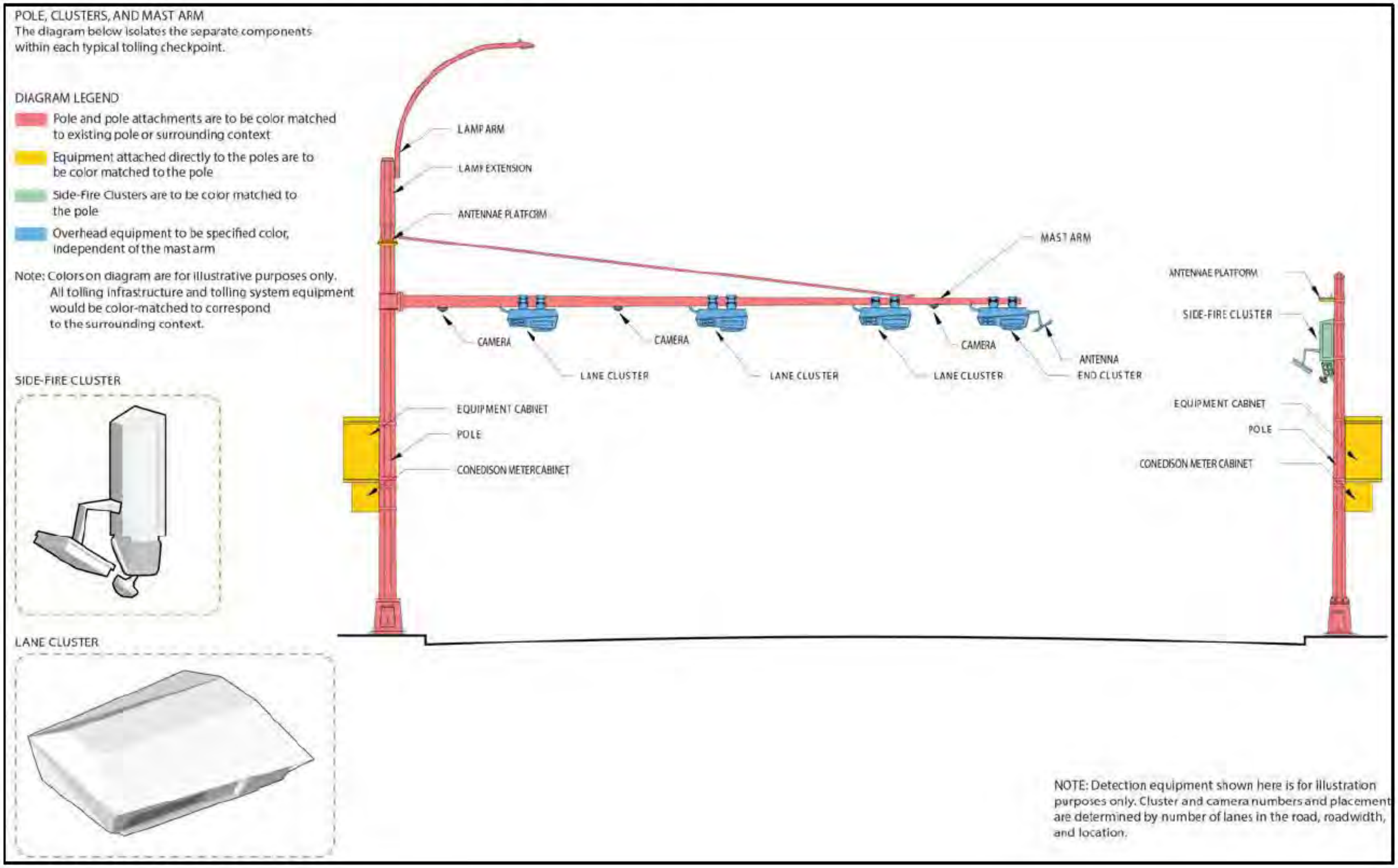
- **Approach to 60th Street/Exits Across 60th Street.** For vehicles driving southbound on the avenues approaching 60th Street, signs would provide notice of the toll at 96th Street, 72nd Street, and 66th Street. An example of these signs is shown in **Appendix 2D, Figure 2D-2**. The signs would be located on existing infrastructure where practicable and on new signposts as needed. Wider streets would have signs on both sides of the street. Thus, each southbound approach to 60th Street would have three to six signs between approximately 96th and 66th Streets, depending on the width of the street.

  Signs would also be located along southbound avenues close to the CBD boundary, generally between 62nd Street and 60th Street. **Appendix 2D, Figure 2D-3**, illustrates typical signage in this area. Signs would also notify drivers in vehicles driving east and west across 61st Street, as shown in **Appendix 2D, Figure 2D-3**. There would be approximately nine signs close to 60th Street for each southbound approach.

  Within the Manhattan CBD, there would be "end toll zone" signs on northbound avenues close to the 60th Street boundary. Each northbound approach would have approximately two "end toll zone" signs.

  These signs on local streets would range in size from 30 inches by 24 inches to 48 inches by 35 inches.

Figure 2-3. Typical Tolling Infrastructure and Tolling System Equipment



Source: TransCore, Parsons, Dattner Architects

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- **FDR Drive and West Side Highway/Route 9A.** Signage would notify drivers of the toll at locations along the FDR Drive and the West Side Highway/Route 9A near exits from those highways. (As noted earlier, drivers who use these highways would not be subject to the toll; the toll would apply once they enter the Manhattan CBD from the highway.) To reduce the number of signs at each exit from these highways into the Manhattan CBD, signage with maximum toll rates would be placed only at locations on the highways at the limits of the zone (e.g., on the West Side Highway/Route 9A near 60th Street, on the West Side Highway/Route 9A and at the exit of the Hugh L. Carey Tunnel).

  Appendix 2D, Figure 2D-4, shows a typical entry and exit from the FDR Drive into the Manhattan CBD. Upon approach to the CBD boundary, drivers would typically see four signs. An "end toll zone" sign would be located at all entrances to the FDR Drive from the Manhattan CBD, indicating to the driver that they are exiting the zone and entering an excluded roadway.

  Appendix 2D, "Project Alternatives: CBD Tolling Program Signage," Figure 2D-5, shows the signage at a typical West Side Highway/Route 9A intersection with the local street grid.

  Signs along the FDR Drive and the West Side Highway/Route 9A would range in size from 30 inches by 24 inches to 54 inches by 36 inches.

- **Brooklyn, Queens, and New Jersey Approaches.** For drivers entering the Manhattan CBD using an East River crossing from Brooklyn or Queens, signs along the highways leading to these crossings would notify drivers of the toll. A typical sequence is shown in **Appendix 2D, Figure 2D-6.** Existing signs would be modified to add necessary toll information where practicable. Following this typical signage sequence, there would be approximately 10 to 20 signs on the approach to each crossing, depending on the unique conditions of each highway approach.

  There would also be signs on the Manhattan CBD side of these crossings indicating the start of the CBD for westbound traffic and the end of the CBD for eastbound traffic. The number of signs in these areas would vary based on the structure and layout of the ramps for these crossings.

  For crossings between New Jersey and the Manhattan CBD, signage in New Jersey would follow a similar signage pattern and would use existing infrastructure to the greatest extent practicable. Signage in this area would be coordinated with the appropriate local jurisdictions during final design.

- **Central Park.** While public vehicular traffic is not permitted in Central Park, authorized vehicles (e.g., emergency response vehicles, park maintenance, park administration, vendors, and contractors) may use the roads when necessary. Two new signposts would be added within Central Park to notify drivers of entry into the CBD if they exit the park onto 59th Street. These signs would be on West Drive, a one-way southbound road, and next to the southbound lane of East Drive approaching Grand Army Plaza. **Appendix 2D, Figure 2D-7,** illustrates the two signs that would be installed at each of these approaches. The "begin toll zone" sign would be 30 inches by 24 inches and the "max toll rate" sign would be 36 inches by 36 inches. The signs would be affixed to a standard signpost that is approximately 3.5 inches by 2 inches in cross section at approximately 7 feet in height.

2.4.2.3 Logical Termini

The joint NEPA regulations of FHWA, the Federal Transit Administration, and the Federal Railroad Administration (23 CFR Section 771.111(f)) require that actions evaluated under NEPA must "connect logical termini and be of sufficient length to address environmental matters on a broad scope." Logical termini are defined as rational end points both for a transportation improvement and for a review of the environmental effects. This requirement in the regulations ensures that NEPA evaluations consider a full project, without dividing it into separate pieces so as to change the conclusions about the action's environmental effects. The CBD Tolling Alternative described in this chapter and evaluated in subsequent chapters of this EA satisfies this requirement.

The CBD Tolling Alternative described in this chapter and evaluated in the EA encompasses all locations where tolling infrastructure and tolling system equipment would be installed as well as the entire Manhattan CBD, which would be subject to the new toll. In addition, the CBD Tolling Alternative could affect travel in a larger area than the Manhattan CBD; therefore, this EA considers the effects of the Project on a regional study area consisting of 28 counties that include New York City and the surrounding area. The 28-county area encompasses the area where most trips to and from the Manhattan CBD originate and/or terminate and is large enough to include any area where effects of the CBD Tolling Alternative could occur and where mitigation could be required because of the CBD Tolling Alternative. See also **Chapter 3, "Environmental Analysis Framework,"** for a discussion of the 28-county regional study area.

2.4.2.4 Tolling Scenarios for Environmental Review

This EA includes evaluation of multiple tolling scenarios within the CBD Tolling Alternative to identify the range of potential effects that could occur from implementing the Project. If the TBTA Board adopts a toll schedule structure that has substantially different attributes from those examined in this EA, the Project Sponsors would review these changes with FHWA and other resource agencies, as appropriate, and identify a course of action to assess and document the changes in accordance with NEPA prior to implementation of the Project.

As described in the following subsections, all tolling scenarios have some features in common, including variable tolling, in which toll rates are higher during peak periods when congestion is greatest. All tolling scenarios also include a higher toll on designated "Gridlock Alert" days[23] when congestion is higher than during typical peak periods.

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[23] NYCDOT designates the busiest traffic days of the year as Gridlock Alert days and, to address the traffic congestion that occurs then, requests that travelers in New York City consider walking, biking, or taking public transportation whenever possible on Gridlock Alert days. Gridlock Alert days are designated in advance based on past traffic data and include select days in the November-December holiday period as well as days (typically in September) when the United Nations General Assembly is in session. In 2021, there were 19 designated Gridlock Alert days. https://portal.311.nyc.gov/article/?kanumber=KA-02759. In advance of and during Gridlock Alert days, NYCDOT provides messages on roadways throughout the city warning drivers of the Gridlock Alert day and the potential for severe congestion.

The amount of any higher toll for Gridlock Alert days has not yet been determined, and the transportation modeling conducted for this Project and described in **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** did not include modeling of a higher toll on Gridlock Alert days because it considered typical days rather than days with unusually high traffic levels.

The tolling scenarios vary in their assumptions about other factors, such as the amount of the toll for different types of vehicles, the times tolls would be imposed, exemptions from tolling, crossing credits for tolls paid on other toll tunnels or bridges,[24] and discounts in the form of "caps" on the number of tolls per 24-hour period to be applied to different types of vehicles. To meet the Project objective of creating a funding source for capital improvements and generating sufficient annual net revenues to fund $15 billion for capital projects for the MTA Capital Program, tolling scenarios that provide crossing credits, discounts, and/or exemptions have a higher toll value than those without these elements.

In all tolling scenarios, vehicles using E-ZPass would be subject to lower toll rates than those without E-ZPass that pay via the Tolls by Mail program. In addition, with the exception of one tolling scenario in which all vehicles would be charged the same toll rate, the remainder of the tolling scenarios would apply different toll rates to different classes of vehicles—with autos, motorcycles, and commercial vans subject to the lowest rate and large trucks to the highest rate.

Table 2-3 provides a summary of the similarities and differences among the tolling scenarios, and **Appendix 2E, "Project Alternatives: Definition of Tolling Scenarios,"** provides more detail on toll rates.

Tolling Scenario A – Base Plan

Tolling Scenario A, which would have the lowest toll rates of any of the tolling scenarios evaluated, represents the basic tolling program described in the Traffic Mobility Act without any modifications that might be recommended by the Traffic Mobility Review Board and adopted by TBTA.

In Tolling Scenario A, vehicles accessing the Manhattan CBD using TBTA and PANYNJ CBD crossings would pay the tolls for the TBTA or PANYNJ crossing—as they do today—and the Manhattan CBD toll; vehicles using a crossing into the Manhattan CBD that is untolled today (i.e., the Brooklyn, Manhattan, Williamsburg, and Ed Koch Queensboro Bridges) would pay only the Manhattan CBD toll. As with existing conditions, which include a mix of untolled and tolled river crossings, some drivers would choose crossings based on their lower cost even if that route were less direct or slower.

As with all the scenarios, autos, commercial vans, and motorcycles would be charged a Manhattan CBD toll no more than once per day. Taxis, FHVs, buses, and small or large trucks would pay the toll each time they access the Manhattan CBD (see **Table 2-3**). The tolls in this tolling scenario would vary by the following time periods:

- A peak period from 6 a.m. to 8 p.m. on weekdays and 10 a.m. to 10 p.m. on weekends
- An off-peak period from 8 p.m. to 10 p.m. on weekdays
- An overnight period from 10 p.m. to 6 a.m. on weekdays and 10 p.m. to 10 a.m. on weekends

[24] These credits are referred to in this EA as "crossing credits" and are a credit against the Manhattan CBD toll for tolls paid on TBTA and PANYNJ facilities connecting to the Manhattan CBD or Manhattan. Crossing credits have the potential to rationalize existing traffic imbalances between the tolled and untolled East River crossings, which lead to excess vehicle travel and congestion as motorists travel out of their way to avoid a toll (known as "bridge shopping"). However, providing crossing credits for currently tolled facilities would require increases to the toll amount to meet the Project objective related to revenue, and would affect traffic patterns by increasing or decreasing traffic in other localized locations as described in this EA.

Table 2-3. Tolling Scenarios Evaluated for the CBD Tolling Alternative

PARAMETER[1]	SCENARIO A Base Plan	SCENARIO B Base Plan with Caps and Exemptions	SCENARIO C Low Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO D High Crossing Credits for Vehicles Using Tunnels to Access the CBD	SCENARIO E High Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO F High Crossing Credits for Vehicles Using Manhattan Bridges and Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO G Base Plan with Same Tolls for All Vehicle Classes
Time Periods[2]							
Peak: Weekdays	6 a.m. to 8 p.m.	6 a.m. to 8 p.m.	6 a.m. to 8 p.m.	6 a.m. to 8 p.m.	6 a.m. to 8 p.m.	6 a.m. to 10 a.m.; 4 p.m. to 8 p.m.	6 a.m. to 8 p.m.
Peak: Weekends	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.	10 a.m. to 10 p.m.
Off Peak: Weekdays	8 p.m. to 10 p.m.	8 p.m. to 10 p.m.	8 p.m. to 10 p.m.	8 p.m. to 10 p.m.	8 p.m. to 10 p.m.	10 a.m. to 4 p.m.	8 p.m. to 10 p.m.
Overnight: Weekdays	10 p.m. to 6 a.m.	10 p.m. to 6 a.m.	10 p.m. to 6 a.m.	10 p.m. to 6 a.m.	10 p.m. to 6 a.m.	8 p.m. to 6 a.m.	10 p.m. to 6 a.m.
Overnight Weekends	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.	10 p.m. to 10 a.m.
Potential Crossing Credits							
Credit Toward CBD Toll for Tolls Paid at the Queens-Midtown, Hugh L. Carey, Lincoln, Holland Tunnels	No	No	Yes	Yes	Yes	Yes	No
Credit Toward CBD Toll for Tolls Paid at the Robert F. Kennedy, Henry Hudson, George Washington Bridges	No	No	No	No	No	Yes	No
Potential Exemptions and Limits (Caps) on Number of Tolls per Day							
Autos, motorcycles, and commercial vans	Once per day	Once per day	Once per day	Once per day	Once per day	Once per day	Once per day
Taxis	No cap	Once per day	Exempt	No cap	Exempt	Once per day	No cap
FHVs	No cap	Once per day	Three times per day	No cap	Three times per day	Once per day	No cap
Small and large trucks	No cap	Twice per day	No cap	No cap	No cap	Once per day	No cap
Buses	No cap	Exempt	No cap	No cap	Transit buses – Exempt No cap on other buses	Exempt	No cap
Approximate Toll Rate Assumed[3]							
Peak	$9	$10	$14	$19	$23	$23	$12
Off Peak	$7	$8	$11	$14	$17	$17	$9
Overnight	$5	$5	$7	$10	$12	$12	$7

1 The parameters in this table were assumed for modeling purposes to evaluate the range of potential effects that would result from implementation of the CBD Tolling Alternative. Actual toll rates, potential credits, exemptions, and/or discounts, and the time of day when the toll rates would apply would be determined by the TBTA Board after recommendations are made by the Traffic Mobility Review Board. **Appendix 2E, "Project Alternatives: Definition of Tolling Scenarios,"** provides more detailed information on the rates, potential crossing credits, exemptions, and/or discounts assumed for each tolling scenario.

2 Tolls would be higher during peak periods when traffic is greatest. These would be set forth by TBTA in the final toll schedule. All tolling scenarios include a higher toll on designated "Gridlock Alert" days, although the modeling conducted for the Project did not reflect this higher toll since it considers typical days rather than days with unusually high traffic levels.

3 Toll rates are for autos, commercial vans, and motorcycles using E-ZPass and are rounded. For all tolling scenarios, different rates would apply for vehicles not using E-ZPass; for Tolling Scenarios A through F, different vehicle classes would pay different tolls (see **Appendix 2E, "Definition of Tolling Scenarios"**). The peak E-ZPass rate (rounded) range across tolling scenarios for small trucks would be $12–$65; for large trucks, the range would be $12–$82.

Tolling Scenario B – Base Plan with Caps and Exemptions

Tolling Scenario B is largely the same as Tolling Scenario A, but it adds caps on the number of times small and large trucks would pay up to two times each day (Table 2-3), and buses would be exempt from the Manhattan CBD toll. The tolls in this tolling scenario would vary by the same time periods as Tolling Scenario A. Given the caps on tolls and exemptions, the toll rates for Tolling Scenario B would be higher.

Based on the modeling conducted for the Project, Tolling Scenario B would not meet the Project's objective related to raising revenue for the MTA Capital Program with the toll rates identified in this EA. Tolling Scenario B was included in the analyses to provide consideration of a tolling scenario with lower toll rates and substantial caps and exemptions, which was a combination repeatedly requested by the public during development of this EA. An additional variation of the original Tolling Scenario B was modeled with toll rates that are 30 percent higher than the original Tolling Scenario B for all vehicle classes across all time periods, which would meet the revenue objective.

Tolling Scenario C – Low Crossing Credits for Vehicles Using Tunnels to Access the Manhattan CBD, with Some Caps and Exemptions

In Tolling Scenario C, vehicles with E-ZPass that access the Manhattan CBD using the four tunnel crossings (Hugh L. Carey Tunnel, Queens-Midtown Tunnel, Holland Tunnel and Lincoln Tunnel) would receive a crossing credit toward the Manhattan CBD toll. The crossing credits would flatten the cost differential for Manhattan-bound traffic between the inbound Queens-Midtown and Hugh L. Carey Tunnels and the East River bridges, to reduce so-called "bridge shopping" that occurs when drivers choose their route into the Manhattan CBD based on cost, rather than time. Vehicles without E-ZPass would not receive any crossing credits.

With Tolling Scenario C, taxis would be exempt from the Manhattan CBD toll, and FHVs would pay the Manhattan CBD toll no more than three times each day (Table 2-3). Buses and small and large trucks would pay the Manhattan CBD toll for all trips each day. The tolls in this tolling scenario would vary based on the same time periods as Tolling Scenarios A and B.

Given the crossing credits, caps, and exemptions, the toll rates for Tolling Scenario C would be higher than Tolling Scenarios A and B; it would have lower toll rates than Tolling Scenarios D, E, and F (which have higher crossing credits).

Tolling Scenario D – High Crossing Credits for Vehicles Using Tunnels to Access the Manhattan CBD

Tolling Scenario D would be similar to Tolling Scenario C, but with no caps or exemptions and a higher crossing credit toward the Manhattan CBD toll for all vehicles with E-ZPass that access the Manhattan CBD using the four tunnel crossings. The higher crossing credit would further flatten the cost differential for drivers who pay a two-way toll at TBTA tunnels or the higher tolls at the PANYNJ tunnels.

With Tolling Scenario D, taxis, FHVs, buses, and small and large trucks would pay the Manhattan CBD toll for all trips each day (Table 2-3). The tolls in this tolling scenario would vary based on the same time periods as Tolling Scenario A.

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Given the higher crossing credits, the toll rates for Tolling Scenario D would be higher than Tolling Scenarios A, B, and C and lower than Tolling Scenarios E and F.

Tolling Scenario E – High Crossing Credits for Vehicles Using Tunnels to Access the Manhattan CBD, with Some Caps and Exemptions

Tolling Scenario E would have the same crossing credits as Tolling Scenario D, but would also have some caps and exemptions. As in Scenario C, taxis and FHVs would have a cap of no more than three Manhattan CBD tolls each day (Table 2-3). Transit buses would be exempt while non-transit buses (including privately operated bus services and jitneys) and small and large trucks would pay the Manhattan CBD toll each time they access the Manhattan CBD. The tolls in this tolling scenario would vary based on the same time periods as Tolling Scenario A.

Given the high crossing credits, caps on tolls, and exemptions, the toll rates for Tolling Scenario E would be higher than any of the other tolling scenarios except Tolling Scenario F; notably, while the auto toll rates would be the same as Tolling Scenario F, truck and bus tolling rates would be lower.

Tolling Scenario F – High Crossing Credits for Vehicles Using Manhattan Bridges and Tunnels to Access the Manhattan CBD, with Some Caps and Exemptions

Tolling Scenario F would provide a crossing credit toward the CBD toll for all vehicles with E-ZPass that access the Manhattan CBD and use a tolled crossing to access Manhattan. While Tolling Scenarios C, D, and E would provide crossing credits for Manhattan CBD crossings, Tolling Scenario F would also provide crossing credits for the TBTA Robert F. Kennedy Bridge and Henry Hudson Bridge and the PANYNJ George Washington Bridge. This credit would be the same as in Tolling Scenarios D and E and higher than in Tolling Scenario C. This would flatten the cost differential that would occur in other tolling scenarios between drivers who access the Manhattan CBD via a Manhattan CBD crossing and those who use a crossing outside the Manhattan CBD, to reduce the effects of drivers selecting their crossing and route to and from the Manhattan CBD based on toll costs rather than other factors, such as travel time or distance.

With Tolling Scenario F, taxis and FHVs would be charged a CBD toll once per day (Table 2-3), and buses would be exempt, while small and large trucks would pay the Manhattan CBD toll each time they access the Manhattan CBD. Importantly, the peak, off-peak, and overnight time periods would differ from the other tolling scenarios:

- The peak period would be 6 a.m. to 10 a.m. and 4 p.m. to 8 p.m. on weekdays and 10 a.m. to 10 p.m. on weekends.
- The off-peak period would be 10 a.m. to 4 p.m. on weekdays.
- The overnight period would be 8 p.m. to 6 a.m. on weekdays and 10 p.m. to 10 a.m. on weekends.

Given the high crossing credits, caps on tolls, and exemptions, the toll rates, Tolling Scenario F would have the same Manhattan CBD toll rates for autos as Tolling Scenario E, but higher truck and bus toll rates.

Tolling Scenario G – Base Plan with Same Tolls for All Vehicle Classes

Following completion of a preliminary analysis of Tolling Scenarios A through F, and in response to concerns raised during early public outreach for the Project, the Project Sponsors identified a potential modification to the Base Plan (Tolling Scenario A) that would reduce the number of trucks that would divert around the Manhattan CBD, particularly those diverting to the South Bronx and Staten Island. This modification, Tolling Scenario G, would apply the same toll rates to all vehicle classes instead of charging higher rates small and large trucks and buses (**Table 2-3**). As with Tolling Scenario A, there would be no crossing credits in Tolling Scenario G, and taxis, FHVs, buses, and small or large trucks would pay the Manhattan CBD toll each time they access the Manhattan CBD.

In addition, a variation of Tolling Scenario G was modeled to test the impact of adding a one-charge-per-day cap to taxis and FHVs. Given this cap, toll rates for other vehicles would be approximately 10 percent higher than in original Tolling Scenario G.

[Additional Sensitivity Analyses for Tolling Scenarios

In addition to Tolling Scenarios A through G, the Project Sponsors also conducted sensitivity analyses for additional, modified tolling scenarios. These included a modified Tolling Scenario B with a higher toll value, modifications to Tolling Scenarios A, D, and G to limit the number of times each day that taxis and FHVs would pay a toll, and a further modified Tolling Scenario B with a cap on tolls for taxis and FHVs of no more than once per day, no tolls from 12:00 a.m. to 6:00 a.m., a cap on the number of tolls for trucks of no more than twice each day, and exemptions for all buses. More information on these modified scenarios is provided in Chapter 3, "Environmental Assessment Framework," Section 3.3.3 and Chapter 16, "Summary of Effects," Section 16.2.4.4. Importantly, the additional analyses demonstrated that these changes to the tolling scenarios do not change the fundamental conclusions of the EA.]

2.4.2.5 Discussion of Effects of Individual Components of Tolling Scenarios

The most important factor in the magnitude and distribution of Project effects is the toll rate. Overall, the CBD Tolling Alternative would reduce congestion regionally and within the Manhattan CBD. On a local level, near and adjacent to the Manhattan CBD, depending on the toll structure, there would be localized increases and decreases resulting from vehicles diverting to avoid the CBD toll. When considering the effects of various parameters other than the toll rate—such as crossing credits, peak periods, and exemptions and caps for taxis and FHVs or other vehicles—it is important to understand that these would not be applied in isolation from changes in the toll rate. One of the four objectives of the Project is to create a funding source for capital improvements and generate sufficient annual net revenues to fund $15 billion for capital projects for the MTA Capital Program. As a result, the more vehicles that are given crossing credits, exemptions, etc., the higher the toll must be to ensure sufficient revenues are generated, which in turn would lead to additional diversions and other resultant effects.

The modeling conducted for the Project demonstrates that all the tolling scenarios would reduce traffic entering the Manhattan CBD, and there would be an overall net benefit in congestion reduction for the region as well. As more discounts, crossing credits, and exemptions are provided, the toll rate would increase, aiding in congestion reduction, but increasing the cost for each driver. Tolling scenarios with

higher toll rates (e.g., Tolling Scenarios D, E, and F) would have greater reductions in traffic entering the Manhattan CBD compared to those with lower toll rates, as well as more increases in transit ridership. As the toll rate increases, more traffic diversions would occur as drivers try to avoid the toll, leading to less traffic in the Manhattan CBD, but localized increases elsewhere.

Crossing credits, which reduce the toll amount paid in the Manhattan CBD for drivers who use certain tolled tunnels or bridges, would change the locations where traffic reductions would occur. Tolling scenarios with crossing credits (i.e., Tolling Scenarios C, D, E, and F) would have less effect on reducing traffic entering the Manhattan CBD from Queens, and much less effect on reducing traffic entering from New Jersey than tolling scenarios without crossing credits (i.e., Tolling Scenarios A, B, and G). With higher crossing credits (e.g., Tolling Scenarios E and F), more traffic would occur at the Queens-Midtown Tunnel and the Hugh L. Carey Tunnel, resulting in more traffic on the Long Island Expressway and a shift of traffic along the Gowanus Expressway from the Brooklyn-Queens Expressway (BQE) to the Hugh L. Carey Tunnel as well as increases in traffic on the local streets in Manhattan that connect to and from these tunnels.

Additional discussion of these effects follows:

- Toll Price – Compared to the No Action Alternative, when a toll for drivers entering or remaining in the Manhattan CBD is introduced, the following would occur:
  - Traffic in the Manhattan CBD – Reductions in both the total VMT and the total number of vehicles within the Manhattan CBD. Broadly speaking, without other variables, as the toll increases, greater reductions in vehicles in the Manhattan CBD and VMT would occur. In addition, traffic-related air emissions and noise in the Manhattan CBD would also decrease because of lower VMT and vehicles in the Manhattan CBD.
  - Traffic Regionally – Model results indicate that overall VMT and traffic levels would also be reduced regionally with the introduction of the Manhattan CBD toll, albeit at a lower level than within the Manhattan CBD. The reduction of Manhattan CBD traffic would typically occur as the result of one of two decisions by drivers with respect to paying the toll:
    - Drivers choosing to switch to a public transit option; or
    - Drivers choosing to divert around the Manhattan CBD via the regional highway network.
  - While reduced traffic would occur on a regional basis, providing regional improvements in air quality and noise, some specific routes would experience increases in the number of vehicles and VMT due to diversion of traffic. Tolling Scenarios A, B, and G would result in reduced traffic volumes at all Manhattan CBD crossings but some increase in traffic along circumferential routes that would avoid the Manhattan CBD tolls. Tolling Scenario C, D, E, and F would lead to higher traffic diversions and potential localized traffic effects at the Queens-Midtown Tunnel and Hugh L. Carey Tunnel, as well as higher traffic volumes along circumferential routes along the Cross Bronx Expressway and the Staten Island Expressway. All tolling scenarios would result in an increase in traffic along the FDR Drive between East 10th Street and the Brooklyn Bridge.

  - In essence, as the toll rate increases, reductions in both the number of total vehicles and total VMT would occur, but the increased rate of vehicles diverting around the Manhattan CBD would limit the overall regional improvements.

- Truck Toll Price – Across all tolling scenarios, the total number of large- and medium-truck trips within the 28-county regional study area would remain relatively consistent. However, because trucks do not have an alternative mode available, the only means for avoiding the Manhattan CBD toll would be to divert around the Manhattan CBD, leading to localized increases and decreases in truck traffic, the magnitude of which varies by scenario. Large trucks, in particular, would be affected by whether the CBD toll rates are lower, higher, or similar to tolls on the TBTA bridge and tunnel facilities that provide connections to the Manhattan CBD. Thus, the truck toll price, which was modeled at two to three times the amount of the auto toll in Scenarios A through F, and the same as the auto toll in Scenario G, is included as a separate parameter to allow a better understanding of the effects of the Project on this vehicle class.

  With increasing toll rates, the number of trucks within the Manhattan CBD would decline, but diversions would increase. Given that some Hudson River, East River, and Harlem River crossings, as well as the New York State parkway network, have vehicle height restrictions, these truck diversions would be concentrated for the most part on the regional expressway system, in particular the Cross Bronx Expressway, Long Island Expressway, Brooklyn-Queens Expressway, and Staten Island Expressway.

  For the Manhattan CBD specifically, increasing the truck toll rates would result in a reduction in truck through-trips, those truck trips with an origin or destination within the Manhattan CBD would not be as affected.

  The lowest toll rate for trucks would result in fewer truck diversions; however, this would also have the lowest reduction in the number of trucks entering the Manhattan CBD and the smallest improvements in associated traffic congestion, air quality, and noise within the Manhattan CBD.

  In response to concerns raised during early public outreach regarding the inability of trucks to switch to transit for their trips and the potential for truck diversions, especially to the Cross Bronx Expressway, Tolling Scenario G was added to demonstrate that truck diversions and associated traffic and air quality effects would decrease as the truck toll is priced lower (in this case, the same as the passenger vehicle toll).

- Crossing Credits – Tolling Scenarios C, D, and E would provide crossing credits to drivers who are already paying a toll to enter the Manhattan CBD at TBTA and PANYNJ tunnels. (Tolling Scenario C would provide a lower credit; Tolling Scenarios D and E a higher credit.) Tolling Scenario F would extend these crossing credits to the George Washington, Henry Hudson, and Robert F. Kennedy Bridges.

  With each of these tolling scenarios, there would be an increase in the toll to meet the Project's revenue objective.

Given that increased crossing credits would come with higher tolls, truck diversions would also increase, resulting in noticeable reductions of truck through trips in the Manhattan CBD, but localized increases outside the Manhattan CBD.

With increasing crossing credits, higher vehicle volumes and VMT would occur at currently tolled entrance points to the Manhattan CBD, especially the Queens-Midtown Tunnel and the Hugh L. Carey Tunnel, resulting in more traffic on the Long Island Expressway and a shift of traffic along the Gowanus Expressway from the BQE to the Hugh L. Carey Tunnel, as well as increases in traffic on the local Manhattan streets that connect to these tunnels.

Higher crossing credits would lead to a larger mode shift from auto to transit for drivers entering the Manhattan CBD. Those tolling scenarios with the highest crossing credits would also have the highest mode shifts to transit outside of New York City, with increased ridership on commuter rail services and PATH.

- Time of Day – The effect of variable tolling at different times of the day is also considered.

  Particularly in the overnight period, reducing the toll rate on trucks and other vehicles would reduce the diversion to alternative routes and limit increases to traffic on circumferential routes. This would reduce the overall vehicle and VMT improvement in the Manhattan CBD when compared with other tolling scenarios, although these reduced benefits would occur for the time period when congestion is less of a concern.

  Previous studies have shown that while trucks are unlikely to shift their travel time, for private vehicles such options would be limited for the most part for Tolling Scenarios A through E, where the peak period would extend from 6 a.m. to 8 p.m. Tolling Scenario F would instead have two distinct peak periods, an AM peak (6 a.m. to 10 a.m.) and a PM peak (4 p.m. to 8 p.m.). A small portion of drivers would shift to enter the Manhattan CBD to the period of 5:30 a.m. to 6:00 a.m. in all tolling scenarios.

- Exemptions and Caps for Taxis and FHVs – As noted previously, while passenger vehicles may be charged only once daily, other vehicles may be charged each time they enter or remain in the Manhattan CBD. Several tolling scenarios include an option to provide caps to the number of times tolls would be charged for taxis and/or FHVs and/or exemptions for taxis and/or FHVs. The more exemptions and caps provided, the higher tolls need to be to meet the Project's congestion and revenue objectives. However, if taxis and FHVs are charged for each trip, the demand for their service would decline, as would the number of trips they make.

  Introducing caps or exemptions for taxis and/or FHVs would increase the number of vehicles and VMT within the Manhattan CBD relative to Tolling Scenario A, which would have no such caps or exemptions.

  Including an exemption for taxis would result in an increase in taxi mode share relative even to cases where taxis are capped at once per day; however, this would also result in an associated increase in VMT and vehicles.

  As with all the other variables, the more exemptions and caps provided, the higher the tolls would have to be to meet the revenue objective. Conversely, fewer (or no) exemptions and caps on taxis and FHVs

would result in a lower toll and less demand for taxis and FHV trips into and out of the Manhattan CBD, which would reduce the number of vehicles and VMT in the Manhattan CBD.

2.5 PREFERRED ALTERNATIVE

FHWA and the Project Sponsors have identified the CBD Tolling Alternative as the Preferred Alternative for the Project. The CBD Tolling Alternative would meet the Project purpose, which is to reduce traffic congestion in the Manhattan CBD in a manner that will generate revenue for future transportation improvements, pursuant to acceptance into the FHWA's Value Pricing Pilot Program. The CBD Tolling Alternative would also meet all four objectives identified for the Project (see **Chapter 1, "Introduction"**), as well as the screening criteria FHWA and the Project Sponsors used in the assessment of preliminary alternatives discussed in Section 2.3.

Table 2-4 illustrates how the CBD Tolling Alternative would meet the Project objectives and the specific evaluation criteria that FHWA and the Project Sponsors used in assessing preliminary alternatives and Table 2-5 provides more detail comparing the results for each of the tolling scenarios within the CBD Tolling Alternative. **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** provides more information on the transportation-related effects of the tolling scenarios. In addition, **Chapter 16, "Summary of Effects,"** compares the effects of the tolling scenarios and provides information on additional tolling scenarios considered but not evaluated in detail in this EA.

A preferred tolling scenario within the CBD Tolling Alternative has not been identified, though the analyses in this EA afford an understanding of how, if warranted, the toll schedule can be structured to avoid adverse effects. As described previously, the TBTA Board would adopt a final toll schedule, including toll rates and any crossing credits, discounts, and/or exemptions informed by recommendations made by the Traffic Mobility Review Board and following a public hearing in accordance with the State Administrative Procedure Act.

The selected alternative for the Project will be identified in the FHWA's decision document in consideration of comments received throughout the environmental review process, including those received on this EA and from the public outreach.

Table 2-4. Comparison of Evaluation Results for the No Action and CBD Tolling Alternatives

SCREENING CRITERION	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE
Purpose and Need: Reduce traffic congestion in the Manhattan CBD in a manner that will generate revenue for future transportation improvements	Does not meet	Meets
Objective 1: Reduce daily VMT within the Manhattan CBD Criterion: Reduce by 5% (relative to No Action)	Does not meet	Meets
Daily VMT reduction (2023)	*0%*	*7.1%-9.2%*
Objective 2: Reduce the number of vehicles entering the Manhattan CBD daily Criterion: Reduce by 10% (relative to No Action)	Does not meet	Meets
Daily vehicle reduction (2023)	*0.0%*	*15.4%-19.9%*
Objective 3: Create a funding source for capital improvements and generate sufficient annual net revenues to fund $15 billion for capital projects for MTA's Capital Program	Does not meet	Meets [1]
Net revenue to support MTA's Capital Program [2]	*$0*	*$1.02 billion - $1.48 billion*
Objective 4: Establish a tolling program consistent with the purposes underlying the New York State legislation entitled the "MTA Reform and Traffic Mobility Act"	Does not meet	Meets

1 Although Tolling Scenario B would not meet Objective 3 with the toll rates identified and assessed in this EA, additional analysis was conducted to demonstrate that it would meet this objective with a higher toll rate; the resulting VMT reduction and revenue for that modified scenario would fall within the range of the other scenarios presented. **Chapter 16, "Summary of Effects,"** provides more information on the modified Tolling Scenario B.

2 The net revenue needed to fund $15 billion depends on a number of economic factors, including but not limited to interest rates and term. For the purposes of this EA, the modeling assumes the Project should provide at least $1 billion annually in total net revenue, which would be invested or bonded to generate sufficient funds. The net revenue values provided in this table are rounded and based on Project modeling.

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Table 2-5. Comparison of Evaluation Results for CBD Tolling Alternative Tolling Scenarios

SCREENING CRITERION	SCENARIO A Base Plan	SCENARIO B Base Plan with Caps and Exemptions	SCENARIO C Low Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO D High Crossing Credits for Vehicles Using Tunnels to Access the CBD	SCENARIO E High Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO F High Crossing Credits for Vehicles Using Manhattan Bridges and Tunnels to Access the CBD, with Some Caps and Exemptions	SCENARIO G Base Plan with Same Tolls for All Vehicle Classes
Purpose and Need: Reduce traffic congestion in the Manhattan CBD in a manner that will generate revenue for future transportation improvements	Meets	Meets	Meets	Meets	Meets	Meets	Meets
Objective 1: Reduce daily VMT within the Manhattan CBD Criterion: Reduce by 5% (relative to No Action)	Meets	Meets	Meets	Meets	Meets	Meets	Meets
Daily VMT reduction (2023)	7.8%	7.6%	8.0%	8.7%	9.2%	7.1%	8.4%
Objective 2: Reduce the number of vehicles entering the Manhattan CBD daily Criterion: Reduce by 10% (relative to No Action)	Meets	Meets	Meets	Meets	Meets	Meets	Meets
Daily vehicle reduction (2023)	15.4%	15.7%	17.3%	18.7%	19.9%	18.3%	16%
Objective 3: Create a funding source for capital improvements and generate sufficient annual net revenues to fund $15 billion for capital projects for MTA's Capital Program	Meets	Does not meet[1]	Meets	Meets	Meets	Meets	Meets
Net revenue to support MTA's Capital Program [2]	$1.06 billion	$830 million	$1.10 billion	$1.34 billion	$1.48 billion	$1.02 billion	$1.10 billion
Objective 4: Establish a tolling program consistent with the purposes underlying the New York State legislation entitled the "MTA Reform and Traffic Mobility Act"	Meets	Meets	Meets	Meets	Meets	Meets	Meets

1 Although Tolling Scenario B would not meet Objective 3 with the toll rates identified and assessed in this EA, additional analysis was conducted to demonstrate that it would meet this objective with a slightly higher toll rate and the resulting VMT reduction and revenue for that modified scenario would fall within the range of the other scenarios presented. **Chapter 16, "Summary of Effects,"** provides more information on the modified Tolling Scenario B. it would meet this objective with a modified toll rate, while continuing to meet the other objectives.

2 The net revenue needed to fund $15 billion depends on a number of economic factors, including but not limited to interest rates and term. For the purposes of this EA, the modeling assumes the Project should provide at least $1 billion annually in total net revenue, which would be invested or bonded to generate sufficient funds. The net revenue values provided in this table are rounded and based on Project modeling.

3. Environmental Analysis Framework

3.1 FEDERAL APPROVALS AND CLASS OF ACTION

The CBD Tolling Program is classified as a NEPA Class III EA action in accordance with 23 Code of Federal Regulations (CFR Section 771.115). NEPA Class III actions are those in which the significance of the environmental impact is not clearly established. This EA has been prepared to determine whether the Project is likely to have a significant impact and requires the preparation of an Environmental Impact Statement.

3.2 COORDINATION WITH FEDERAL AND STATE RESOURCE AGENCIES

FHWA and the Project Sponsors have sought the expertise of and/or information from the following Federal and New York State agencies in preparing this EA:

- U.S. Federal Transit Administration (FTA)
- U.S. Environmental Protection Agency (USEPA)
- U.S. National Park Service (NPS)
- *[U.S. Department of Health and Human Services (HHS)]*
- New York State Department of Environmental Conservation (NYSDEC)
- New York State Department of State (NYSDOS)
- New York State Historic Preservation Office at the New York State Office of Parks, Recreation and Historic Preservation (OPRHP or SHPO)

FHWA and the Project Sponsors coordinated with these agencies about their areas of expertise with respect to methodologies for documenting environmental conditions and assessing effects. The Project Sponsors also coordinated with New York City agencies about potential effects on resources under their jurisdiction, including the New York City Department of Parks and Recreation, the New York City Department of Environmental Protection, *[the New York City Department of Health and Mental Hygiene, the New York City Taxi and Limousine Commission, the New York City Department of Education]*, and the New York City Landmarks Preservation Commission. There have been and will continue to be meetings with the agencies during this NEPA review. The recommendations of these agencies have been considered and incorporated into this EA, as appropriate.

FHWA has also coordinated with Federally recognized Native American tribes, and FHWA and the Project Sponsors coordinated with transportation agencies from throughout the New York City region *[(Connecticut, New Jersey, and New York)]*. The Project Sponsors also conducted extensive outreach to environmental justice (minority and low-income) populations in the regional study area. (Refer to Chapter 18, "Agency Coordination and Public Participation," for more information about agency participation in the NEPA process.)

3.3 ANALYSIS FRAMEWORK

This EA describes the potential environmental effects of the CBD Tolling Alternative compared to the No Action Alternative. This environmental analysis complies with FHWA's *Environmental Impact and Related Procedures* (23 CFR Part 771) and applicable Federal guidance and procedures, including FHWA guidance provided in its environmental review toolkit.[1] Although the MTA Reform and Traffic Mobility Act exempts the Project from the environmental review procedures of the New York State Environmental Quality Review Act and New York City Environmental Quality Review, NYSDOT's *The Environmental Manual* and New York City's *City Environmental Quality Review Technical Manual* (*CEQR Technical Manual*) were used for certain analyses because these are widely accepted methodologies for environmental studies in New York State and New York City, respectively.[2, 3]

NYSDOT and the New York City Mayor's Office of Environmental Coordination oversee *The Environmental Manual* and the *CEQR Technical Manual*, respectively. Both are updated regularly to reflect changes in regulations or to incorporate new or modified methodologies that reflect experience gained through environmental reviews and real-world conditions. Updates to these documents are undertaken in consultation with other New York State and New York City agencies, including the following:

- New York State Department of Environmental Conservation (NYSDEC)
- OPRHP and SHPO
- MTA
- New York City Department of City Planning (NYCDCP)
- New York City Department of Environmental Protection
- NYCDOT
- New York City Landmarks Preservation Commission

Each chapter of this EA identifies the methodology used for the analysis presented in the chapter.

The 2021 *CEQR Technical Manual*, issued in December 2021, establishes that the lead agency should consider whether supplemental analysis to reflect an updated methodology of the 2021 *CEQR Technical Manual* should be undertaken, taking into account as necessary the scheduled timing of completion of environmental review under the applicable approval process. Based on the timing of completion of analyses and scheduled public and agency review, the 2020 *CEQR Technical Manual* is used as the basis for this EA.

1 https://www.environment.fhwa.dot.gov.
2 NYSDOT. *The Environmental Manual.* https://www.dot.ny.gov/divisions/engineering/environmental-analysis/manuals-and-guidance/epm.
3 The 2021 *CEQR Technical Manual*, issued in December 2021, establishes that the lead agency should consider whether supplemental analysis to reflect an updated methodology of the *CEQR Technical Manual* should be undertaken, taking into account as necessary the scheduled timing of completion of environmental review under the applicable approval process. Based on the timing of completion of analyses and scheduled public and agency review, the 2020 *CEQR Technical Manual* is used as the basis for this EA.

3.3.1 Study Areas

A regional study area and multiple local study areas were used to assess the potential effects of the Project. The regional study area was used to examine changes in travel patterns resulting from the CBD Tolling Alternative while different local study areas were used to identify more localized effects like the potential effects of constructing tolling infrastructure and tolling system equipment, changes in roadway traffic and access to transit stations; and social, economic, or environmental effects. Chapter 1, "Introduction," provides an overview of development patterns, demographic characteristics, and commuting patterns within the study areas. The affected environment sections of the subsequent chapters of this EA describe the Project setting within the study areas relevant to, and appropriate for, the technical topic that is the subject of the chapter. The affected environment section provides context for the assessment of the Project's effects presented in the environmental consequences sections that follow in each chapter.

3.3.1.1 Regional Study Area

The regional study area includes 28 counties that are incorporated in the Best Practice Model (BPM), which is the New York City region's primary long-range travel forecasting model (Figure 3-1). These 28 counties represent the main catchment area for trips to and from the Manhattan CBD:

- New York City counties (Bronx, Kings [Brooklyn], New York [Manhattan], Queens, and Richmond [Staten Island])
- Long Island counties (Nassau and Suffolk)
- New York counties north of New York City (Dutchess, Orange, Putnam, Rockland, and Westchester)
- New Jersey counties (Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, and Warren)
- Connecticut counties (Fairfield and New Haven)

3.3.1.2 Local Study Areas

As previously stated, multiple local study areas were used for the analyses presented in this EA. Figure 3-2a through Figure 3-2g show the areas where installation of tolling infrastructure and tolling system equipment associated with the Project is proposed, and this is referred to as the local study area for tolling infrastructure and tolling system equipment. In addition, Figure 3-3a through Figure 3-3j show the proposed locations of the tolling infrastructure and tolling system equipment.

The local study area for tolling infrastructure and tolling system equipment includes more locations than the Project Sponsors would need to implement the Project because the ability of the Project Sponsors to locate tolling infrastructure and tolling system equipment on property controlled by the Port Authority of New York and New Jersey (PANYNJ) is uncertain. The Project Sponsors are coordinating with PANYNJ about potentially locating tolling infrastructure and equipment on property associated with the Lincoln and Holland Tunnels. If PANYNJ agrees to locate the tolling infrastructure and equipment on its property, then the Project Sponsors can eliminate several detection points on local streets near the Lincoln and Holland Tunnels. This EA includes the tolling infrastructure and tolling system equipment both on PANYNJ property and at locations nearby that could be eliminated if PANYNJ approves the use of its property by the Project Sponsors.

Figure 3-1. Regional Study Area

Source: ArcGIS Online, https://www.arcgis.com/index.html.

3.3.2 Analysis Years

This EA examines future conditions in the opening year of the Project and in a long-term planning horizon year:

- Estimated Time of Completion (Opening Year 2023): This EA uses an estimated time of Project completion date of 2023, when the system would be fully operational.
- Long-Term Planning Horizon Year (2045): FHWA typically considers the environmental effects of its undertakings for a long-term horizon year, which is 20 to 30 years after a project's estimated time of completion. For this Project, the long-term planning horizon analysis year aligns with the BPM's long-range forecast year, which is 2045.

3.3.3 CBD Tolling Alternative Tolling Scenarios

This EA includes multiple tolling scenarios within the CBD Tolling Alternative to identify the range of potential effects that could occur from implementing the CBD Tolling Alternative. (See Chapter 2, "Project Alternatives," Section 2.4.2.4 for more information on the tolling scenarios.) The Project Sponsors conducted quantitative modeling of the potential transportation effects of each tolling scenario using the BPM (see Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling").

The tolling scenarios are relevant to the environmental analyses that quantify the potential benefits or negative effects of changes in traffic and/or transit riders on a particular topic of analysis (e.g., intersection operations, pedestrian circulation, air quality, noise). For each of these topics, this EA describes the effects of the tolling scenario that would result in the greatest potential negative effects for that particular topic of analysis. For example, the analysis of potential impacts on traffic intersection operations is based on the tolling scenario that would result in the greatest increase in vehicle volumes at the intersections in the study area. This methodology results in the most potential negative effects of the CBD Tolling Alternative, and other tolling scenarios would result in lesser or fewer negative effects. This EA identifies the tolling scenario used for the analysis presented in each chapter. In addition, Chapter 16, "Summary of Effects," compares the effects of the tolling scenarios.

[For the Final EA, the Project Sponsors committed to additional mitigation measures (see Chapter 16, "Summary of Effects," Table 16-2), including a discounted toll rate for low-income drivers, a further reduced overnight toll rate, and a cap of once per day on tolls for taxis and for-hire vehicles (FHVs). In addition to the broader sensitivity analysis described in Chapter 16, "Summary of Effects," Section 16.2.4.4, the following demonstrates that these new mitigation commitments neither require a change in the tolling scenarios used for the analyses in the EA, nor change the fundamental conclusions of the EA:

- *Discounted Toll Rate for Low-Income Drivers: Traffic effects from the discounted toll rate for low-income drivers would fall within the range of effects explored through the tolling scenarios in the EA, given the small number of low-income frequent drivers who have no reasonable alternative, relative to the total*

number of drivers, and given that drivers would still pay a toll, so this discount would not be an incentive for additional people to drive to the Manhattan CBD.

- *Further Reduced Overnight Toll Rate: The analyses of the Project's effects on traffic, transit, parking, pedestrians, air quality, and noise evaluate effects during peak periods, which are the periods when existing and Project-generated traffic and pedestrian volumes would be highest. Further reduced overnight toll rates would not result in increased volumes during the peak periods and therefore would not change the conclusions of the analyses.*
- *Cap on Number of Tolls for Taxis and FHVs:*
  - *Subchapter 4B, "Transportation: Highways and Local Intersections:" The highway analysis and local intersection analyses evaluated Tolling Scenario D, which also represented the effects of Tolling Scenarios E and F. Since Tolling Scenario F included a cap of once per day on tolls for taxis and FHVs, the predicted effects on highway segments and local intersections presented in this subchapter are representative of the effects with the new mitigation in place. An additional traffic analysis was conducted for the Downtown Brooklyn study area where Tolling Scenario C was determined to be the representative tolling scenario. In Tolling Scenario C, taxis are exempt and there is a cap of three times a day on tolls for FHVs; this scenario also performs similarly to Tolling Scenario B, which has a cap of once per day for tolls on taxis and FHVs. Thus, this tolling scenario remains appropriate.*
  - *Subchapter 4C, "Transportation: Transit:" The transit analysis considered the Project's effects using Tolling Scenario E, which was predicted to have the highest transit ridership. In Tolling Scenario E, taxis are exempt and there is a cap of three times a day on tolls for FHVs; this scenario had similar results to those of Tolling Scenario F, which has a cap of once per day on tolls for taxis and FHVs. Thus, this tolling scenario remains appropriate.*
  - *Subchapter 4D, "Transportation: Parking:" The parking analysis evaluated Tolling Scenario D, which also represented the effects of Tolling Scenarios E and F. Since Tolling Scenario F included a cap of once per day on tolls for taxis and FHVs, the predicted effects on parking presented in this subchapter are representative of the effects with the new mitigation in place.*
  - *Subchapter 4E, "Transportation: Pedestrians and Bicycles:" The analysis of pedestrians and bicycles evaluated Tolling Scenario D, which also represented the effects of Tolling Scenarios E and F. Since Tolling Scenario F included a cap of once per day on tolls for taxis and FHVs, the predicted effects on parking presented in this subchapter are representative of the effects with the new mitigation in place.*
  - *Chapter 10, "Air Quality:" The analysis of regionwide (mesoscale) effects of the Project considered Tolling Scenario A, which was predicted to result in the smallest change in vehicle-miles traveled (VMT) compared to the No Action Alternative, and therefore the least benefit. This conclusion remains the same with the addition of the cap of once per day on tolls for taxis and FHVs. The analyses of air quality at local intersections used the same tolling scenarios as the traffic analysis presented in Subchapter 4B. As noted earlier, that analysis remains representative of the effects that would occur with the new mitigation in place. The analysis of highway segments considered the tolling scenarios with the highest annual average daily traffic and highest projected increase in*

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truck volumes due to the Project. These scenarios, Tolling Scenario B, C, and E, each include caps on the number of daily tolls for taxis and FHVs; Tolling Scenario B has a cap of one toll per day, and Tolling Scenarios C and E have an exemption for taxis and a cap of three tolls per day for FHV. All three scenarios are representative of conditions that would occur with a cap of one toll per day for taxis and FHVs.

- *Chapter 12, "Noise:" The analysis of noise used the same tolling scenarios as the traffic analysis presented in Subchapter 4B. As noted earlier, that analysis remains representative of the effects that would occur with the new mitigation in place.*
- *Appendix 17D, "Technical Memorandum:" The analysis of truck traffic proximity used Tolling Scenario E, which has the maximum truck diversions by volume for all census tracts in the 10-county environmental justice study area. As noted earlier in the discussion of the traffic analyses (Subchapter 4B), Tolling Scenarios D, E, and F have similar results. While Tolling Scenario E has an exemption for taxis and a cap of three tolls per day for FHVs, Tolling Scenario F has a cap on tolls for taxis and FHVs of once per day. Consequently, the analysis of Tolling Scenario E is representative of conditions with the mitigation in place. The analysis of non-truck traffic proximity used Tolling Scenarios E and G because, in combination, those scenarios had the largest diversions and the largest potential increases of all tolling scenarios, respectively. Tolling Scenario G performed similarly to Tolling Scenario B, which has a cap of once per day on tolls for taxis and FHVs. Consequently, the analysis of Tolling Scenario G is representative of conditions with the mitigation in place.*

As noted above, for more information on the details and conclusions of the sensitivity analyses conducted by the Project Sponsors, see Chapter 16, "Summary of Effects."]

3.3.4 Social and Economic Data

The social and economic conditions analysis in this EA incorporates data from two primary sources—the U.S. Census Bureau and the BPM.

The EA incorporates census data to describe existing conditions (also known as the "affected environment"). The data are from multiple census products, including the 2015–2019 American Community Survey (ACS) and the 2012–2016 Census Transportation Planning Package (CTPP). These were the most recent versions of these products available at the time the analysis was prepared. Data from the 2012–2016 CTPP is used when there is not a newer, comparable data set available from the 2015–2019 ACS.

The BPM is a complex transportation model, created by New York Metropolitan Transportation Council (NYMTC), used to project future conditions under the No Action Alternative and the CBD Tolling Alternative. Metropolitan planning organizations (e.g., NYMTC) are responsible for modeling and documenting their region's compliance with the Clean Air Act, and they use transportation models for that purpose. NYMTC's transportation planning model is based on data from the 2010 Census, traffic and transit ridership data, household surveys, and comprehensive projections of social and economic trends for the regional study

area to project travel behavior in future years. NYMTC has adjusted and calibrated the model so that it can predict existing as well as future travel patterns. This EA cites the social and economic data from the BPM when describing future conditions based on BPM results (also known as the "environmental consequences" of the Project).

Some data sets from the U.S. Census Bureau and the BPM differ, but they are both valid sources for describing the potential changes anticipated to result from the Project. For example, the census population and household data are available for more recent years; therefore, it is more current than similar data from the BPM. Text, tables, and figures in the chapters of this EA cite the source of the data presented.

Figure 3-2a. Local Study Areas for Tolling Infrastructure and Tolling System Equipment

Sources: NYC Open Data, NYC Planimetrics, https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d; New NYCDCP, BYTES of the BIG APPLE, https://www1.nyc.gov/site/planning/data-maps/open-data.page; ArcGIS Online, https://www.arcgis.com/index.html.

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Figure 3-2b. Local Study Area for Tolling Infrastructure and Tolling System Equipment: Ed Koch Queensboro Bridge and Queens-Midtown Tunnel

Ed Koch Queensboro Bridge 0 100 200 300 FEET

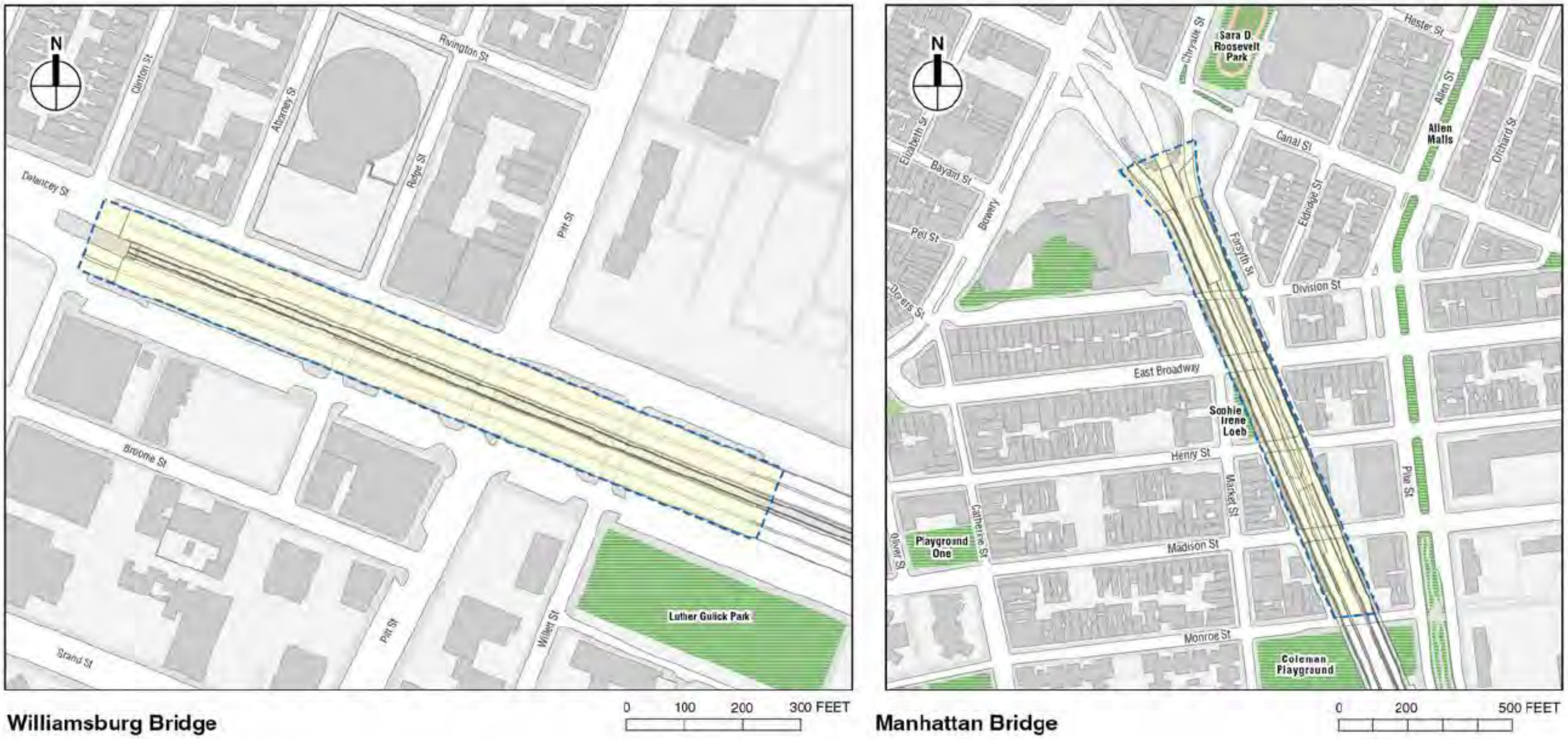
Queens-Midtown Tunnel 0 200 400 FEET

Local Study Area for Tolling Infrastructure and Tolling System Equipment

Park or Recreational Resource in Vicinity of Local Study Area

Sources: NYC Open Data, NYC Planimetrics, https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d; NYCDCP, BYTES of the BIG APPLE, https://www1.nyc.gov/site/planning/data-maps/open-data.page; ArcGIS Online, https://www.arcgis.com/index.html.

Figure 3-2c. Local Study Area for Tolling Infrastructure and Tolling System Equipment: Williamsburg Bridge and Manhattan Bridge

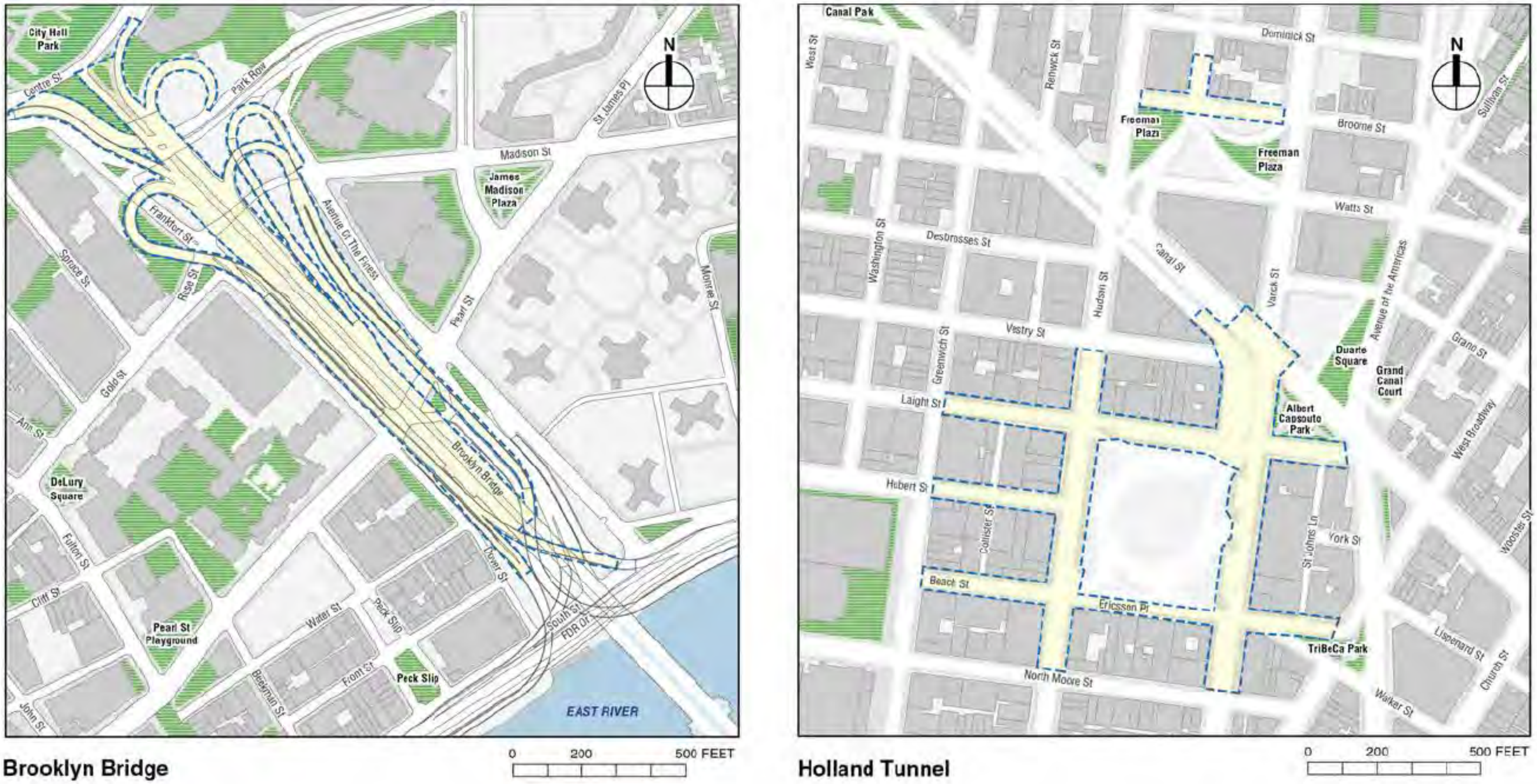


Local Study Area for Tolling Infrastructure and Tolling System Equipment

Park or Recreational Resource in Vicinity of Local Study Area

Sources: NYC Open Data, NYC Planimetrics, https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d; NYCDCP, BYTES of the BIG APPLE, https://www1.nyc.gov/site/planning/data-maps/open-data.page; ArcGIS Online, https://www.arcgis.com/index.html.

Figure 3-2d. Local Study Area for Tolling Infrastructure and Tolling System Equipment: Brooklyn Bridge and Holland Tunnel



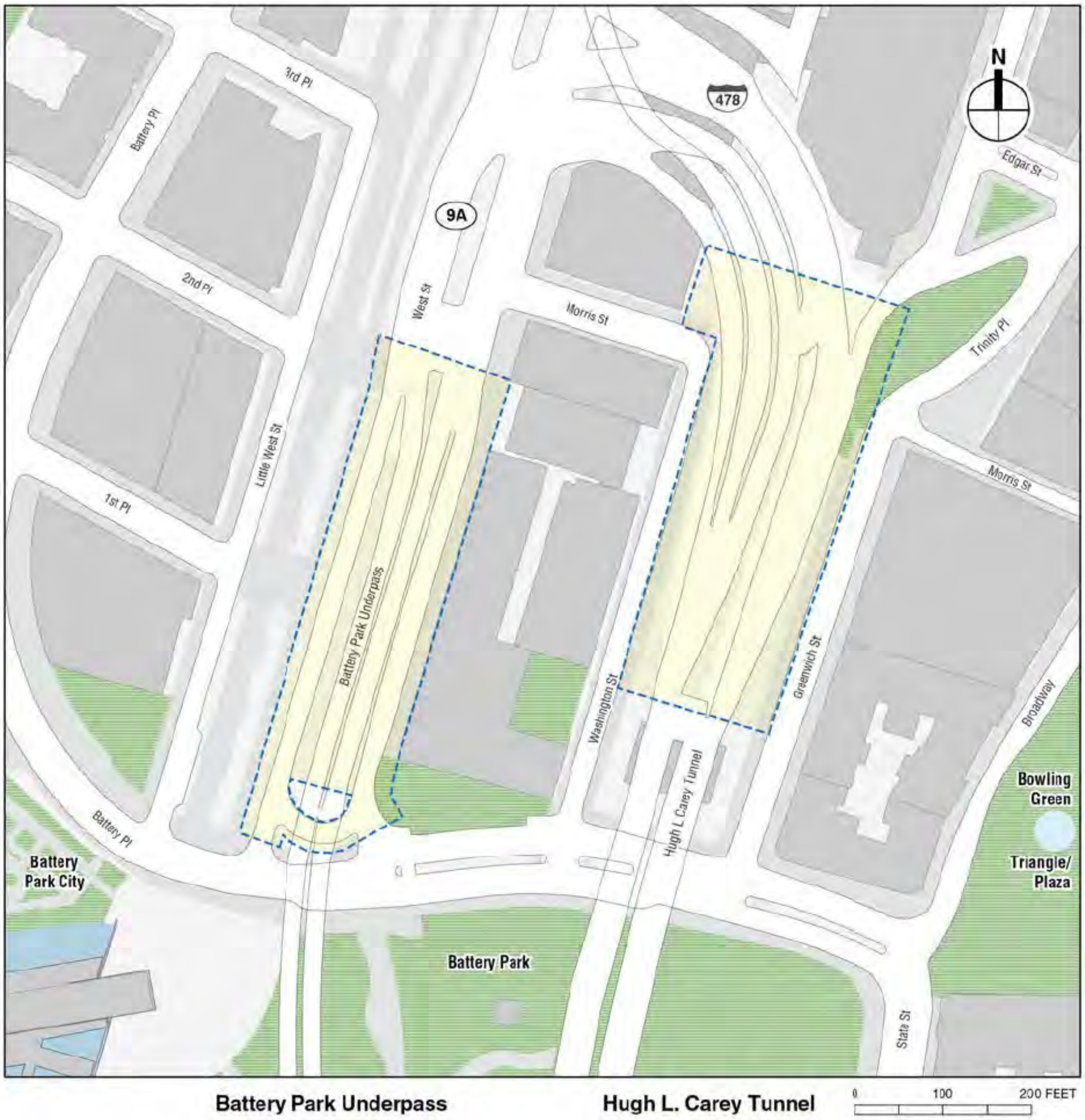
Brooklyn Bridge **Holland Tunnel**

Local Study Area for Tolling Infrastructure and Tolling System Equipment

Park or Recreational Resource in Vicinity of Local Study Area

Sources: NYC Open Data, NYC Planimetrics, https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d; NYCDCP, BYTES of the BIG APPLE, https://www1.nyc.gov/site/planning/data-maps/open-data.page; ArcGIS Online, https://www.arcgis.com/index.html.

Figure 3-2e. Local Study Area for Tolling Infrastructure and Tolling System Equipment: Battery Park Underpass and Hugh L. Carey Tunnel



Local Study Area for Tolling Infrastructure and Tolling System Equipment

Park or Recreational Resource in Vicinity of Local Study Area

Sources: NYC Open Data, NYC Planimetrics, https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d; NYCDCP, BYTES of the BIG APPLE, https://www1.nyc.gov/site/planning/data-maps/open-data.page; ArcGIS Online, https://www.arcgis.com/index.html.

Figure 3-2f. Local Study Area for Tolling Infrastructure and Tolling System Equipment: Lincoln Tunnel

Sources: NYC Open Data, NYC Planimetrics, https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d; NYCDCP, BYTES of the BIG APPLE, https://www1.nyc.gov/site/planning/data-maps/open-data.page; ArcGIS Online, https://www.arcgis.com/index.html.

Figure 3-2g. Local Study Area for Tolling Infrastructure and Tolling System Equipment: 60th Street

60th Street - Western Portion

60th Street - Eastern Portion

Local Study Area for Tolling Infrastructure and Tolling System Equipment

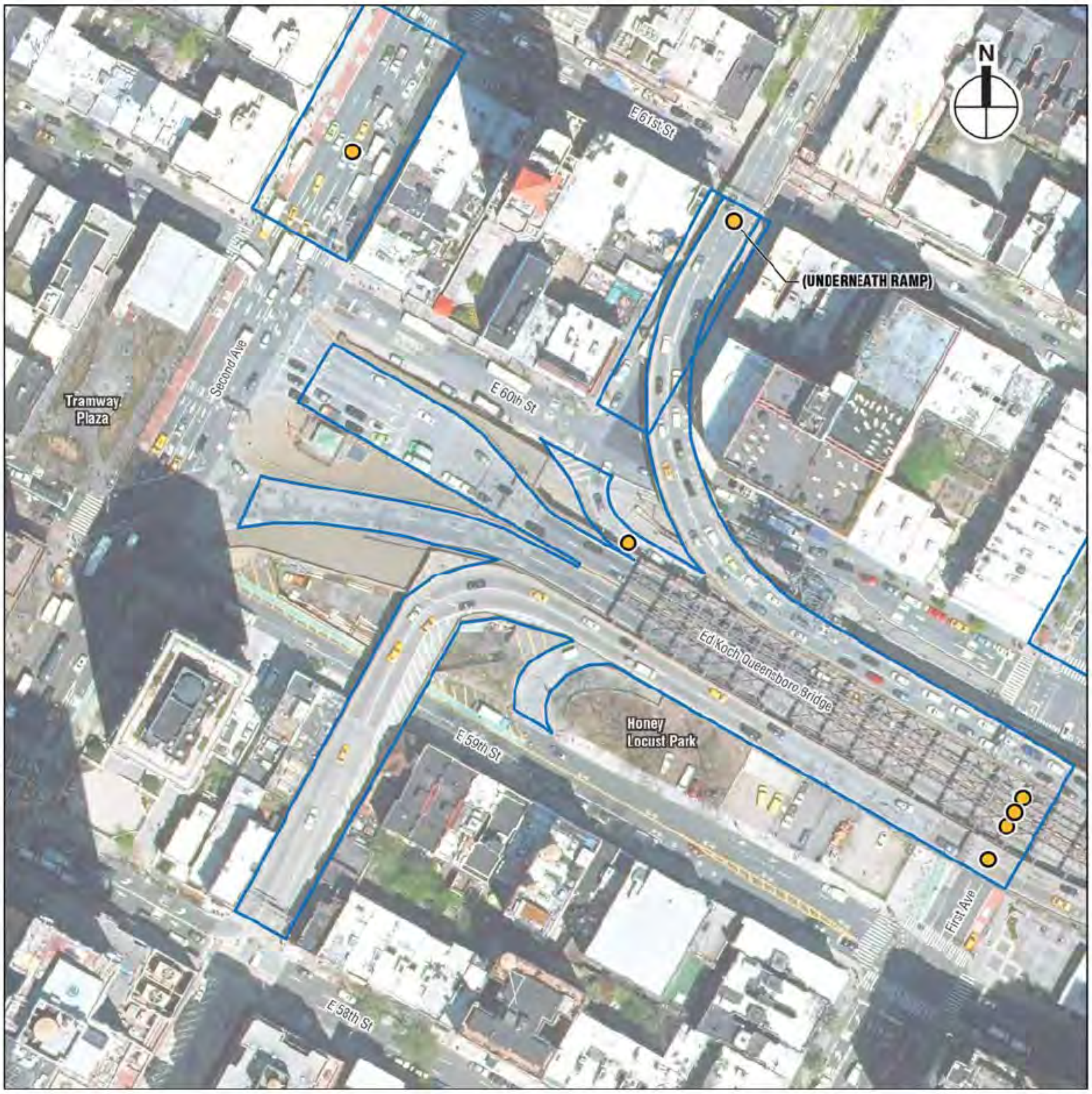
Park or Recreational Resource in Vicinity of Local Study Area

Sources: NYC Open Data, NYC Planimetrics, https://data.cityofnewyork.us/Transportation/NYC-Planimetrics/wt4d-p43d; NYCDCP, BYTES of the BIG APPLE, https://www1.nyc.gov/site/planning/data-maps/open-data.page; ArcGIS Online, https://www.arcgis.com/index.html.

Figure 3-3a. Key Map and Proposed Locations of Tolling Infrastructure and Tolling System Equipment Along FDR Drive and West Side Highway/Route 9A

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: New York Statewide Digital Orthoimagery Program (NYSDOP) High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 3-3b. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Ed Koch Queensboro Bridge



0 200 FEET

Local Study Area for Tolling Infrastructure and Tolling System Equipment

Proposed Location of Tolling Infrastructure and Tolling System Equipment (each circle represents a detection location, which may include one or more new poles or new tolling system equipment mounted on existing infrastructure in that general location)

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 3-3c. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Queens-Midtown Tunnel

Note: No new tolling infrastructure and tolling system equipment proposed in this local study area (existing open road tolling infrastructure would be used)

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

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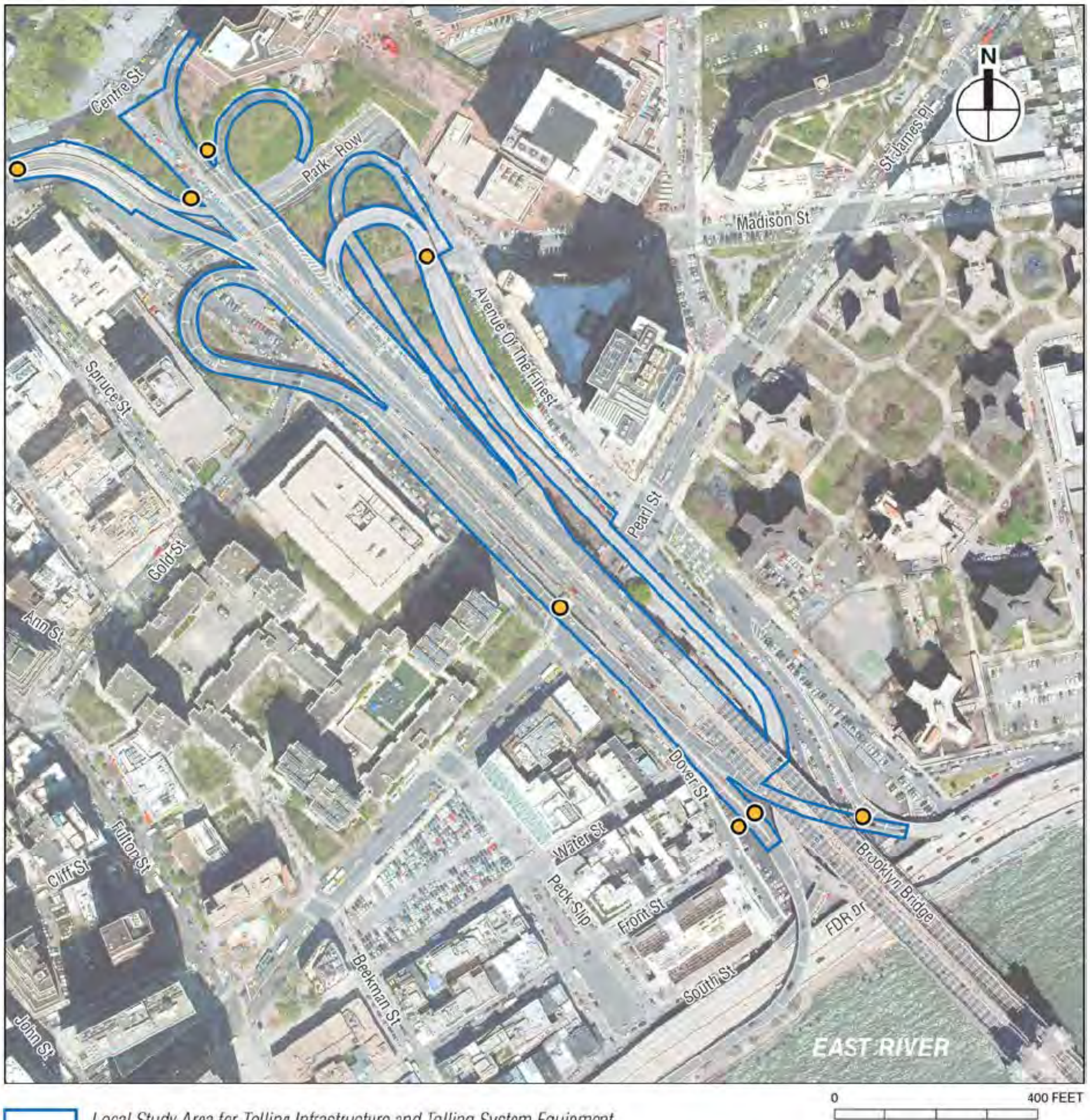
Figure 3-3d. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Williamsburg Bridge

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 3-3e. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Manhattan Bridge

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 3-3f. **Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Brooklyn Bridge**

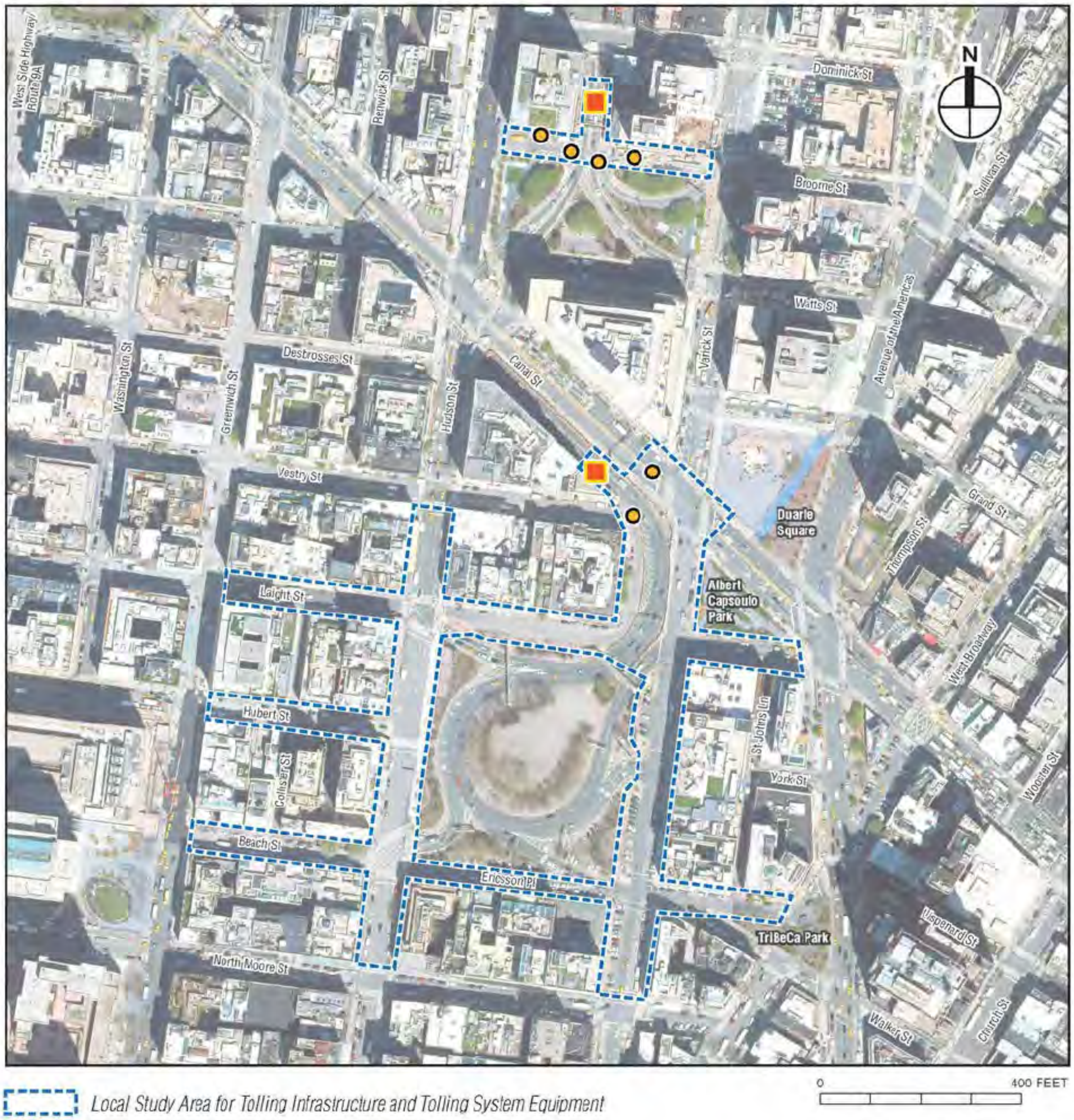


Local Study Area for Tolling Infrastructure and Tolling System Equipment

Proposed Location of Tolling Infrastructure and Tolling System Equipment (each circle represents a detection location, which may include one or more new poles or new tolling system equipment mounted on existing infrastructure in that general location)

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 3-3g. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Holland Tunnel



Local Study Area for Tolling Infrastructure and Tolling System Equipment

Proposed Location of Tolling Infrastructure and Tolling System Equipment (each circle represents a detection location, which may include one or more new poles or new tolling system equipment mounted on existing infrastructure in that general location

Potential Location of Tolling Infrastructure and Tolling System Equipment on PANYNJ Property In Place of All Other Detection Points at and Near the Holland Tunnel

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 3-3h. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Battery Park Underpass and Hugh L. Carey Tunnel

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 3-3i. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: Lincoln Tunnel

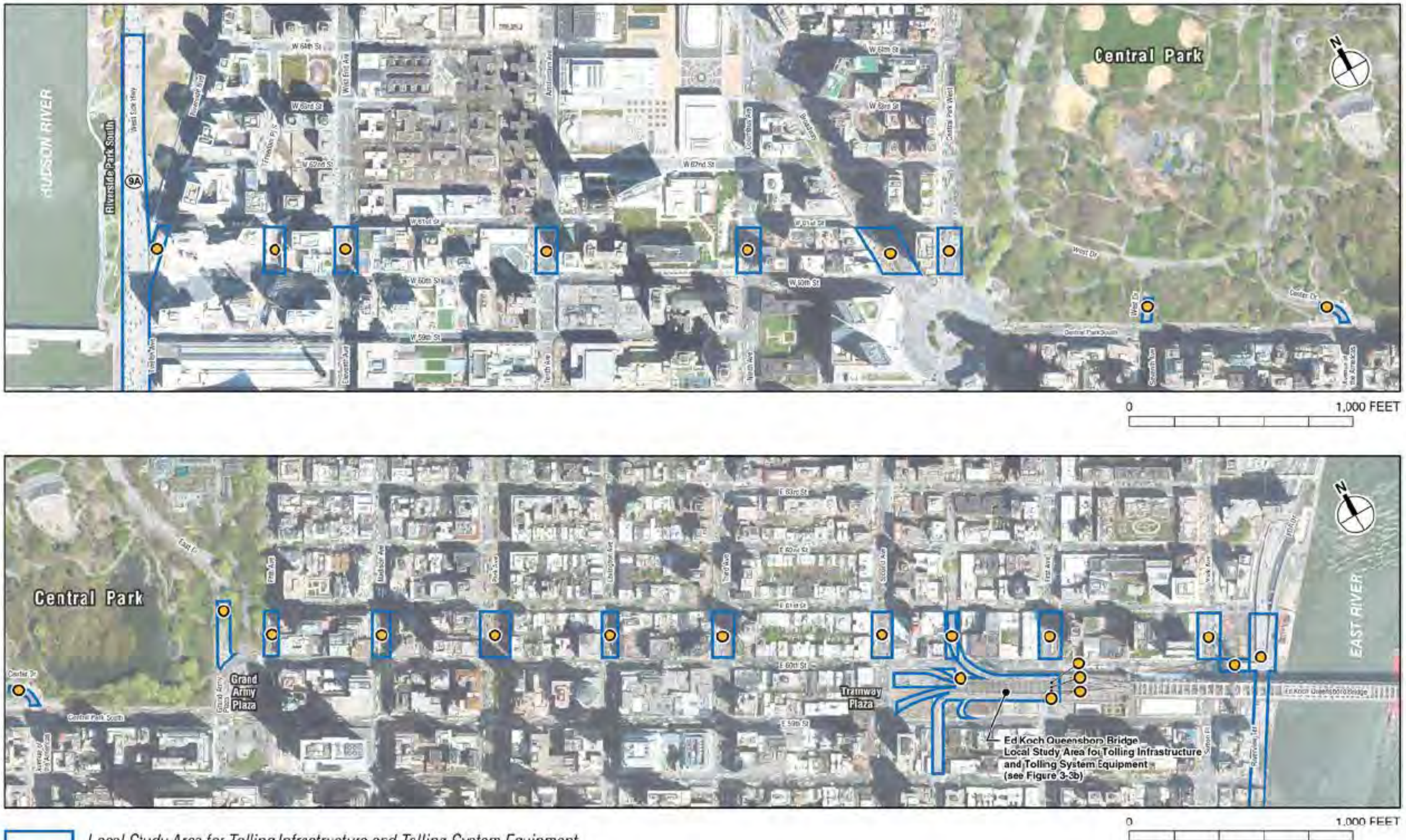
Local Study Area for Tolling Infrastructure and Tolling System Equipment

Proposed Location of Tolling Infrastructure and Tolling System Equipment (each circle represents a detection location, which may include one or more new poles or new tolling system equipment mounted on existing infrastructure in that general location)

Potential Location of Tolling Infrastructure and Tolling System Equipment on PANYNJ Property In Place of All Other Detection Points at and Near the Lincoln Tunnel

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

Figure 3-3j. Proposed Locations of Tolling Infrastructure and Tolling System Equipment: 60th Street



Local Study Area for Tolling Infrastructure and Tolling System Equipment

Proposed Location of Tolling Infrastructure and Tolling System Equipment (each circle represents a detection location, which may include one or more new poles or new tolling system equipment mounted on existing infrastructure in that general location)

Sources: TBTA. October 2021. New York State, NYS Interactive Mapping Gateway: NYSDOP High Resolution Imagery 2000 – 2018. http://gis.ny.gov/gateway/mg/index.html.

4. Transportation

As the commercial and economic hub of the region, 8 million daily trips are made to and from Manhattan's CBD.[1] These trips comprise vehicular trips (e.g., auto, truck, motorcycle), transit (e.g., subway, commuter rail, bus, ferry), and pedestrian and bicycle trips. Trips to and from the Manhattan CBD are generated throughout the 28-county transportation planning region used in this analysis.

Because of the size of the region and the extent of the analysis, this transportation chapter includes five subchapters:

- Subchapter 4A, Regional Transportation Effects and Modeling
- Subchapter 4B, Highways and Local Intersections
- Subchapter 4C, Transit
- Subchapter 4D, Parking
- Subchapter 4E, Pedestrians and Bicycles

A comprehensive analysis of the relevant transportation effects of the CBD Tolling Alternative is provided in each of those subchapters, along with description of the analytical framework and process used to assess the effects discussed therein. Broadly, the process entailed data collection, regional model development, simulations, and quantitative and/or qualitative analyses. Initial context is provided in the following sections to describe the density and complexity of the regional transportation network, particularly when traveling to the Manhattan CBD.

4.1 ROADWAY ACCESS TO THE MANHATTAN CBD

Manhattan is separated from the rest of New York City by the Harlem River, East River, and New York Harbor and from New Jersey by the Hudson River, with 20 vehicular bridges and tunnels connecting to Manhattan. **Figure 4-1** shows the crossings into Manhattan, and **Figure 4-2** shows all vehicular entry and exit points for the Manhattan CBD. **Table 4-1 and Table 4-2** list the bridges and tunnels, and **Table 4-3** lists the 2022 toll rates for automobiles at each of the tolled crossings.

[1] New York Metropolitan Transportation Council, *Hub Bound Travel Data Report 2017*.

Figure 4-1. Existing Vehicular Crossings to Manhattan

Source: ArcGIS Online, https://www.arcgis.com/index.html.

Figure 4-2. Vehicular Entry and Exit Points for the Manhattan CBD

Source: ArcGIS Online, https://www.arcgis.com/index.html.

Table 4-1. Bridges and Tunnels Connecting to Manhattan CBD

BRIDGE OR TUNNEL	LOCATION	JURISDICTION	BRIDGE/TUNNEL TOLL
Brooklyn Bridge	East River–Between Brooklyn and Manhattan	NYCDOT	Untolled
Manhattan Bridge	East River–Between Brooklyn and Manhattan	NYCDOT	Untolled
Williamsburg Bridge	East River–Between Brooklyn and Manhattan	NYCDOT	Untolled
Ed Koch Queensboro Bridge	East River–Between Queens and Manhattan	NYCDOT	Untolled
Queens-Midtown Tunnel	East River–Between Queens and Manhattan	TBTA	Inbound and outbound[1]
Hugh L. Carey Tunnel	New York Harbor–Between Brooklyn and Manhattan	TBTA	Inbound and outbound[1]
Holland Tunnel	Hudson River–Between New Jersey and Manhattan	PANYNJ	Inbound[1]
Lincoln Tunnel	Hudson River–Between New Jersey and Manhattan	PANYNJ	Inbound[1]

Notes:
[1] Inbound = To or entering Manhattan; Outbound = From or leaving Manhattan.
NYCDOT = New York City Department of Transportation.
TBTA = Triborough Bridge and Tunnel Authority.
PANYNJ = Port Authority of New York and New Jersey.

Table 4-2. Bridges Connecting to Manhattan Outside the Manhattan CBD

BRIDGE	LOCATION	JURISDICTION	BRIDGE/TUNNEL TOLL
Broadway Bridge	Harlem River–Between Bronx and Manhattan	NYCDOT	Untolled
University Heights Bridge	Harlem River–Between Bronx and Manhattan	NYCDOT	Untolled
Washington Bridge	Harlem River–Between Bronx and Manhattan	NYCDOT	Untolled
Alexander Hamilton Bridge (I-95)	Harlem River–Between Bronx and Manhattan	NYSDOT	Untolled
Macombs Dam Bridge	Harlem River–Between Bronx and Manhattan	NYCDOT	Untolled
145th Street Bridge	Harlem River–Between Bronx and Manhattan	NYCDOT	Untolled
Madison Avenue Bridge	Harlem River–Between Bronx and Manhattan	NYCDOT	Untolled
Third Avenue Bridge	Harlem River–Between Bronx and Manhattan	NYCDOT	Untolled
Willis Avenue Bridge	Harlem River–Between Bronx and Manhattan	NYCDOT	Untolled
Robert F. Kennedy Bridge	Harlem River and East River–Between Bronx, Queens, and Manhattan	TBTA	Inbound and outbound[1]
Henry Hudson Bridge (Route 9A)	Harlem River–Between Bronx and Manhattan	TBTA	Inbound and outbound[1]
George Washington Bridge (I-95)	Hudson River–Between New Jersey and Manhattan	PANYNJ	Inbound[1]

Notes: Vehicles use these bridges to reach Manhattan and then travel by Manhattan streets to the Manhattan CBD.
[1] Inbound = To or entering Manhattan; Outbound = From or leaving Manhattan.
NYCDOT = New York City Department of Transportation.
NYSDOT = New York State Department of Transportation
TBTA = Triborough Bridge and Tunnel Authority.
PANYNJ = Port Authority of New York and New Jersey.

Table 4-3. 2022 Passenger Vehicle Toll Rates on Bridges and Tunnels Connecting to Manhattan

AGENCY	BRIDGE OR TUNNEL	TOLL DIRECTION[1]	TOLL AMOUNT:* E-ZPass Peak	TOLL AMOUNT:* E-ZPass Off-Peak	OTHER TOLL AMOUNTS*
TBTA	Hugh L. Carey Tunnel	Inbound and outbound	$6.55	$6.55	Tolls by Mail = $10.17 Mid-Tier = $8.36
TBTA	Queens-Midtown Tunnel	Inbound and outbound	$6.55	$6.55	Tolls by Mail = $10.17 Mid-Tier = $8.36
TBTA	Robert F. Kennedy Bridge	Inbound and outbound	$6.55	$6.55	Tolls by Mail = $10.17 Mid-Tier = $8.36
TBTA	Henry Hudson Bridge	Inbound and outbound	$3.00	$3.00	Tolls by Mail = $7.50 Mid-Tier = $4.62
PANYNJ	Holland Tunnel	Inbound	$13.75	$11.75	Tolls by Mail = $16.00
PANYNJ	Lincoln Tunnel	Inbound	$13.75	$11.75	Cash Toll = $16.00 Tolls by Mail = $16.00
PANYNJ	George Washington Bridge	Inbound	$13.75	$11.75	Tolls by Mail = $16.00

1. Inbound = To or entering Manhattan; Outbound = From or leaving Manhattan.

* Toll amounts are for vehicles with two axles and single rear wheels; higher rates apply to other vehicle classes. Discount plans are available for certain vehicles. For more information see https://new.mta.info/fares-and-tolls/bridges-and-tunnels/tolls-by-vehicle/cars and https://www.panynj.gov/bridges-tunnels/tolls.html.

For PANYNJ facilities, E-ZPass rates apply to E-ZPass accounts issued at the E-ZPass New York and New Jersey Customer Service Centers. For TBTA facilities, E-ZPass rates apply to E-ZPass accounts issued at the New York Customer Service Center (NYCSC). For E-ZPass accounts not issued at the NYCSC, customers pay the Tolls by Mail rate. The Mid-Tier toll rate applies to E-ZPass NYCSC customers when not using their properly mounted NYCSC E-ZPass tags, leading to charges being posted to their accounts based on their license plate.

Peak hours for PANYNJ crossings are weekdays 6:00 a.m. to 10:00 a.m. and 4:00 p.m. to 8:00 p.m. and weekends 11:00 a.m. to 9:00 p.m. TBTA does not vary its tolls by time of day.

From Brooklyn, motor vehicles can enter the Manhattan CBD using the Hugh L. Carey Tunnel beneath New York Harbor and the Brooklyn Bridge, Manhattan Bridge, and Williamsburg Bridge across the East River. From Queens, vehicles can use the Queens-Midtown Tunnel, which is the western terminus of the Long Island Expressway (I-495) and runs beneath the East River to connect with multiple streets between East 34th and East 41st Streets and Second and Third Avenues, or the Ed Koch Queensboro Bridge, which reaches Manhattan between East 59th and East 60th Streets at the Manhattan CBD boundary and connects to multiple streets between East 57th and East 62nd Streets. From New Jersey, vehicles can enter the Manhattan CBD using the Holland and Lincoln Tunnels beneath the Hudson River. Motorists from outside the Manhattan CBD can also enter via southbound roadways that enter the Manhattan CBD at 60th Street.

Motorists using the Hugh L. Carey Tunnel and Queens-Midtown Tunnel pay a toll to TBTA, which operates those tunnels and charges a toll in both directions. Motorists using the Holland and Lincoln Tunnels pay a toll to the PANYNJ, which operates those tunnels and charges a toll only in the inbound (to Manhattan) direction. Motorists using the four East River bridges, which are under the jurisdiction of NYCDOT, do not pay a toll.

Some vehicles enter the Manhattan CBD from the north using Manhattan's local street grid or the two highways on its periphery: the West Side Highway/Route 9A and Franklin D. Roosevelt (FDR) Drive. Those vehicles can enter Manhattan using untolled bridges over the Harlem River from the Bronx or one of three other TBTA and PANYNJ crossings: the Robert F. Kennedy Bridge from the Bronx and Queens, a TBTA facility

that is tolled in both directions; the Henry Hudson Bridge over the Harlem River from the Bronx, a TBTA facility that is tolled in both directions; and the George Washington Bridge over the Hudson River from New Jersey, a PANYNJ facility that is tolled in the inbound (to Manhattan) direction.[2]

Motorists must use the river crossings or the West Side Highway/Route 9A and the FDR Drive to access the region's interstate highways located outside the Manhattan CBD. From the Holland Tunnel, vehicles may connect to the New Jersey Turnpike Extension (I-78) and NJ Route 139 to US Routes 1 and 9. From the Lincoln Tunnel, vehicles may connect via NJ Route 495 to the New Jersey Turnpike (I-95) and NJ Routes 3 and 17. From the Hugh L. Carey Tunnel, vehicles may access the Gowanus Expressway (I-278) and Prospect Expressway (NY Route 27) in Brooklyn. The Williamsburg Bridge has direct access to the Brooklyn-Queens Expressway (I-278) in Brooklyn, and the Brooklyn and Manhattan Bridges have ramp connections to the Brooklyn-Queens Expressway near their Brooklyn landings. The Queens-Midtown Tunnel leads directly to the Long Island Expressway (I-495) in Queens. Motorists can access the interstate network north of the Manhattan CBD (I-80, I-87, I-95, and I-278, multiple parkways, and New York and New Jersey state highways) via the West Side Highway/Route 9A and Henry Hudson Parkway or the FDR Drive, either directly or using various connecting roadways. Some facilities such as the FDR Drive and certain parkways prohibit trucks and buses.

4.2 TRANSIT ACCESS TO THE MANHATTAN CBD

The New York metropolitan region has a robust transit network, much of it operating 24 hours per day/7 days per week/365 days per year, and the Manhattan CBD is the hub for much of it. People traveling to the Manhattan CBD can arrive by rail, subway, bus, tram, ferry, and paratransit (Figure 4-3).[3]

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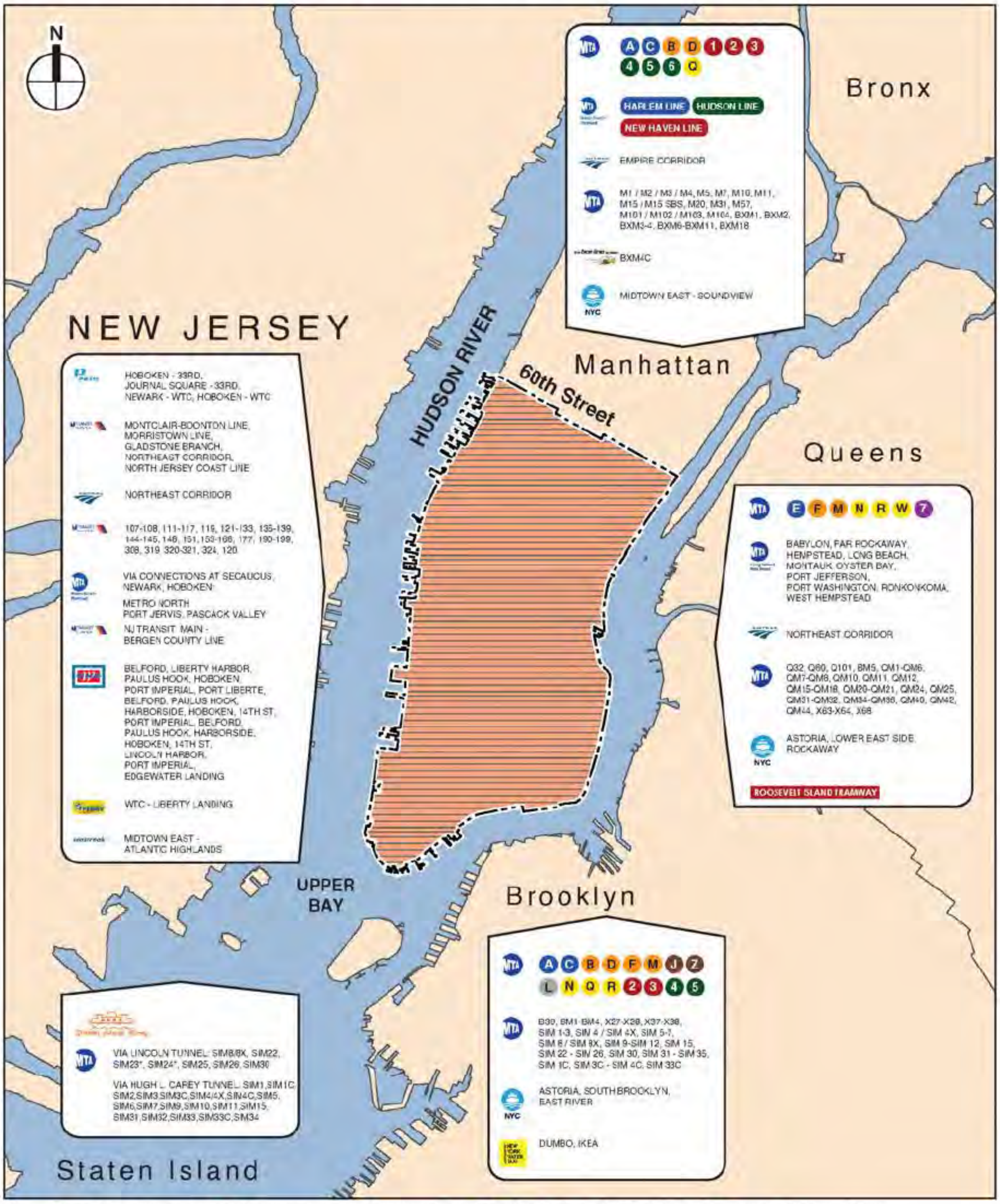
2 TBTA collects tolls at its facilities using open-road, cashless tolling. Tolls are charged to E-ZPass accounts for those who have E-ZPass tags. For vehicles without E-ZPass tags, customers may participate in the regional Tolls by Mail program through which license plate images are matched with information from the relevant Department of Motor Vehicles and a bill is sent to the registered vehicle owner. Motorists can also set up temporary, short-term accounts (for example, if they are planning to use a rental car in New York City). PANYNJ accepts E-ZPass at all of its bridges and tunnels, including the Holland and Lincoln Tunnels and the George Washington Bridge. The Holland Tunnel and the George Washington Bridge operate with cashless tolling. PANYNJ allow*[ed]* cash toll collection at the Lincoln Tunnel *[through December 11, 2022, when it transitioned]* to cashless tolling.

3 A limited number of people also arrive by helicopter at one of three heliports in Manhattan and by seaplane using the Midtown Skyport on the East River.

Figure 4-3. Transit Routes to/from the Manhattan Central Business District (2019)



Notes: Private bus operators connect commuters to various locations within the Manhattan CBD; those routes are not displayed here.
* Operated by Academy Bus

Manhattan CBD (Excluding West Side Highway/Route 9A and FDR Drive)

Transit by Sector

Source: WSP 2022

4.2.1 Subways

The New York City subway is the most widely used transit mode for access to the Manhattan CBD by residents of New York City.[4] It is the largest subway system in the United States, both in terms of miles of track and number of passengers served per year. The subway system comprises 25 routes serving 472 stations across the boroughs of the Bronx, Brooklyn, Manhattan, and Queens with 665 miles of track for transporting passengers (revenue track) with additional track to support operations (nonrevenue track). In 2019, the New York City subway had an average weekday ridership of about 5.5 million people and an annual ridership of 1.66 billion passengers. All but three of the 25 subway routes serve the Manhattan CBD, and the Manhattan CBD contains the system's 10 busiest stations.[5]

New York subway routes form an integrated network with free transfers between routes at many stations in the Manhattan CBD. For example, the Times Square subway station complex, which also includes stations on Sixth and Eighth Avenues, provides free connections between 16 subway routes (A, C, and E; N, Q, R, W, S, and Nos. 1, 2, 3, 7; and B, D, F, and M). The World Trade Center-Fulton Street Station complex in Lower Manhattan provides free transfers between 12 subway routes (E; N, R, and W; and A, C, J, Z, and Nos. 2, 3, 4, 5).[6] The subway also connects with regional transit hubs in the Manhattan CBD, allowing for connections from other modes. These include two stations with direct pedestrian connections to Penn Station New York and Moynihan Train Hall, a station complex beneath Grand Central Terminal, and a connection from the Times Square station complex via the 42nd Street-Port Authority Bus Terminal subway station to the Port Authority Bus Terminal.

In fall 2019, 2,228,000 people entered the Manhattan CBD by subway on an average weekday, which accounted for 58 percent of all people who entered the Manhattan CBD.[7]

4.2.2 Port Authority Trans-Hudson

Port Authority Trans-Hudson (PATH) is a rapid transit system serving Newark, Harrison, Hoboken, and Jersey City in New Jersey, as well as Lower and Midtown Manhattan in New York City. PANYNJ operates the PATH system, which comprises four routes and 13 stations (six in the Manhattan CBD and seven in New Jersey). PATH trains run from either Newark or Hoboken and into the Manhattan CBD with Manhattan termini at the World Trade Center and 33rd Street, just south of Penn Station New York. The system is just about 14 miles total in length. The PATH trains that terminate at West 33rd Street make intermediate stops within the Manhattan CBD. Trains that go to the World Trade Center make only that single stop in Manhattan. PATH train passengers can connect to the New York City subway at multiple PATH stations in

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4 The subway does not provide access to the Manhattan CBD from Staten Island.

5 Metropolitan Transportation Authority. "Subway and Bus Ridership for 2019." https://new.mta.info/agency/new-york-city-transit/subway-bus-ridership-2019.

6 The Cortlandt Street (No. 1 line) subway station is located within the World Trade Center site, but there is no fare-free connection between this station and the World Trade Center-Fulton Street station complex.

7 New York Metropolitan Transportation Council. January 2021. *Hub Bound Travel Data Report 2019*. https://www.nymtc.org/Portals/0/Pdf/Hub%20Bound/2019%20Hub%20Bound/DM_TDS_Hub_Bound_Travel_2019.pdf?ver=GS5smEoyHSsHsyX_t_Zriw%3d%3d.

Manhattan, but they must pay an additional fare. In fall 2019, an average of 273,447 people entered and exited the Manhattan CBD via the PATH train on average weekdays.[8]

4.2.3 Commuter Rail

New York City has the largest commuter rail network in the United States and includes MTA's Long Island Rail Road (LIRR) and Metro-North Railroad (Metro-North), as well as New Jersey Transit Corporation (NJ TRANSIT). Two commuter rail stations are in the Manhattan CBD—Grand Central Terminal and Penn Station New York. Metro-North serves Grand Central Terminal, while LIRR and NJ TRANSIT serve Penn Station New York. Projects are underway that will allow for some LIRR service at Grand Central Terminal and some Metro-North service at Penn Station New York.

LIRR operates between Manhattan and Long Island with station stops in Brooklyn and Queens in New York City and Nassau and Suffolk Counties on Long Island. With an average weekday ridership of 301,000 passengers across 735 trains, it is the busiest commuter railroad in North America. LIRR has 124 stations across 11 regularly operating branches and 319 miles of track in customer service. Most LIRR inbound trains terminate at Penn Station New York. Some LIRR trains terminate at Atlantic Terminal in Brooklyn or Hunters Point Terminal in Queens, where passengers can transfer to the subway and continue their trip to the Manhattan CBD. In addition to the Manhattan CBD, LIRR serves major commercial centers in Downtown Brooklyn and Nassau and Suffolk Counties. In fall 2019, an average of 246,843 people entered and exited the Manhattan CBD via LIRR on weekdays.[9]

Metro-North runs service between New York City and its northern suburbs in New York and Connecticut and provides local rail service within the New York City boroughs of Manhattan and the Bronx. Metro-North has five major branches (though some of the branches have multiple spurs) serving 124 stations within the regional study area. Two branches serve Rockland and Orange Counties, which are north of New York City and west of the Hudson River, and share tracks with NJ TRANSIT en route to their terminal in Hoboken, New Jersey. Three branches provide service between Grand Central Terminal and the Bronx, New York counties east of the Hudson River, and Connecticut. According to MTA, the system has an annual ridership of about 87 million people with close to 400 miles of track in customer service. In addition to serving the Manhattan CBD, Metro-North stops at large commercial districts in Yonkers, White Plains, and New Rochelle in New York as well as Stamford and New Haven, Connecticut. In fall 2019, an average of 226,296 people entered and exited the Manhattan CBD via Metro-North on average weekdays.[10]

NJ TRANSIT commuter rail connects 13 of the 14 New Jersey counties in the regional study area to the Manhattan CBD through its eight branches that serve the New York metropolitan region with close to 450 miles of track in customer service (excludes the Atlantic City branch). The eastern termini of NJ TRANSIT

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8 New York Metropolitan Transportation Council. January 2021. *Hub Bound Travel Data Report 2019*. https://www.nymtc.org/Portals/0/Pdf/Hub%20Bound/2019%20Hub%20Bound/DM_TDS_Hub_Bound_Travel_2019.pdf?ver=GS5smEoyHSsHsyX_t_Zriw%3d%3d.

9 Ibid.

10 Ibid.

trains are Penn Station New York, Newark Penn Station, or the Hoboken Terminal. From Newark, passengers can transfer to a Penn Station New York-bound commuter rail train or can access PATH. From Hoboken, commuters can transfer to PATH or a ferry to complete the journey into the Manhattan CBD. In fall 2019, an average of 212,191 people entered and exited the Manhattan CBD via NJ TRANSIT commuter rail on average weekdays.[11]

4.2.4 Buses

New York City and the regional study area have an extensive network of buses. Commuter buses typically provide direct service between New York City neighborhoods or suburban communities and the Manhattan CBD and other employment centers in the region. Express or limited stop buses provide higher speed service on the more heavily patronized routes, and local buses operate throughout New York City and other counties in the regional study area. MTA has two subsidiaries—New York City Transit and MTA Bus—that operate bus service in New York City. NJ TRANSIT is the primary operator of commuter, express, and local buses in New Jersey, although some private bus operators provide both commuter and local bus services. Multiple public and private bus operators serve the suburban counties of New York and Connecticut.

MTA operates an extensive network of buses in New York City. Combined, New York City Transit and MTA Bus operate 234 local routes, 20 Select Bus Service routes (with payment prior to boarding to reduce dwell times at stops), and 73 commuter/express bus routes. The Manhattan CBD is well-served by buses. Express bus services available from Queens, Brooklyn, the Bronx, and Staten Island offer service to locations in Lower and Midtown Manhattan. The Manhattan CBD has multiple Select Bus Service routes (M14A, M14D, M15, and M23, M34, and M34A), which operate higher speed service with fewer stops than the local bus routes. Local bus routes (some of which have limited service with fewer stops) operate on most north–south avenues through the Manhattan CBD with continued service to Upper Manhattan. Crosstown local bus routes operate between the east and west sides of Manhattan on most two-way crosstown streets (e.g., Houston Street, 14th Street, 23rd Street, 34th Street, 42nd Street, and 57th Street). Crosstown service is available on pairs of one-way streets (e.g., St. Marks Place/Eighth Street and Ninth Street, 49th Street and 50th Street, and East 59th and East 60th Streets). Riders receive one free transfer between local, limited, and Select Bus Service routes and other local and Select Bus Service routes as well as the subway within two hours of the first swipe of a MetroCard. Customers may transfer to or from a commuter bus from a local bus, Select Bus Service bus, or subway, but they must pay the difference in the fare. Riders must pay for a transfer to an express service unless using an Unlimited Express Bus MetroCard.

The busiest bus route in all of New York City is the M15 local/M15 Select Bus Service, which operates along First and Second Avenues in Manhattan from the South Ferry Terminal in Lower Manhattan to 126th Street in the East Harlem neighborhood of Upper Manhattan.

[11] New York Metropolitan Transportation Council. January 2021. *Hub Bound Travel Data Report 2019.* https://www.nymtc.org/Portals/0/Pdf/Hub%20Bound/2019%20Hub%20Bound/DM_TDS_Hub_Bound_Travel_2019.pdf?ver=GS5smEoyHSsHsyX_t_Zriw%3d%3d.

New York City in cooperation with MTA, has included an extensive bus lane network throughout Manhattan and other boroughs to increase bus operating speeds and provide a degree of priority to buses over general traffic lanes.

NJ TRANSIT buses and private bus companies serve New Jersey counties in the regional study area. NJ TRANSIT operates an extensive network of commuter and local bus routes. Many commuter buses provide one-seat ride service between cities and towns in New Jersey and the Port Authority Bus Terminal in the Manhattan CBD, meaning travelers do not need to transfer between buses or from buses to trains to get to the Manhattan CBD. More than 65 NJ TRANSIT bus routes operate between New Jersey and the Port Authority Bus Terminal (PABT). While not every town in New Jersey has one-seat ride service to the Manhattan CBD, NJ TRANSIT provides bus service to all 14 New Jersey counties in the regional study area. Other private bus operators (e.g., Academy Bus Lines, Coach USA, and Trans-Bridge Bus Lines) operate between New Jersey communities within the regional study area (including park-and-ride lots), and either the PABT or curbside stops within the Manhattan CBD.

Limited bus connections are available from Long Island, New York counties north of New York City, and Connecticut to the Manhattan CBD. The Westchester County Department of Transportation's Bee-Line operates an express bus route to the Manhattan CBD from Westchester County. Coach USA operates commuter buses between towns in Rockland and Orange Counties, New York, and the PABT. Hampton Jitney is a private bus service between towns in eastern Long Island (Suffolk County, New York) and the Manhattan CBD. Other private bus operators offer limited operations between communities within the regional study area and either the PABT or curbside stops within the Manhattan CBD.

In the fall 2019, an average of 276,000 people entered and exited the Manhattan CBD by bus on average weekdays.[12]

4.2.5 Ferries

The following ferry operators, both privately owned and publicly owned, provide service to the Manhattan CBD from the other boroughs of New York City and waterfront communities in New Jersey:

- The New York City Economic Development Corporation owns NYC Ferry. The NYC Ferry service is a network of six ferry routes (with a seventh planned) that connects certain waterfront neighborhoods in the Bronx, Queens, Brooklyn, and Staten Island with various piers in the Manhattan CBD, including Wall Street, East 34th Street, and Midtown West at West 37th Street/Pier 79. There are also stops at Stuyvesant Cove (East River at East 20th Street) and Corlears Hook (East River at Jackson Street) within the Manhattan CBD, but only one ferry route serves each of these stops.

12 New York Metropolitan Transportation Council. January 2021. *Hub Bound Travel Data Report 2019.* https://www.nymtc.org/Portals/0/Pdf/Hub%20Bound/2019%20Hub%20Bound/DM_TDS_Hub_Bound_Travel_2019.pdf?ver=GS5smEoyHSsHsyX_t_Zriw%3d%3d.

- NYCDOT operates the Staten Island Ferry between the South Ferry Terminal in Lower Manhattan and the St. George Ferry Terminal in Staten Island.
- New York Waterway is a privately operated ferry system that operates service on multiple routes across the Hudson River between eight piers in Bergen and Hudson Counties in New Jersey and four piers in Midtown and Lower Manhattan.
- Seastreak is a privately owned ferry service that operates between East 34th Street and the Battery Maritime Building piers on the East River in the Manhattan CBD and either Atlantic Highlands or Sandy Hook Beach in Monmouth County, New Jersey.

In the fall 2019, an average of 118,525 people entered and exited the Manhattan CBD via ferry service on average weekdays.[13]

4.2.6 Tram

The Roosevelt Island tram connects Roosevelt Island (an island in the East River between Queens and Manhattan) with Manhattan. The Manhattan terminus is located on Second Avenue between East 59th and East 60th Streets. The entire trip takes about 3 minutes, and the system transports more than 2 million passengers annually. The F subway line also provides service between Roosevelt Island and Manhattan.

4.3 BICYCLE AND PEDESTRIAN ACCESS TO THE MANHATTAN CBD

People may reach the Manhattan CBD on foot or by bicycle. The north–south avenues that cross 60th Street have sidewalks, and bicycle lanes are available on Amsterdam Avenue, Columbus Avenue, Central Park West, Second Avenue, and First Avenue. Shared-use bicycle and pedestrian paths are also along the Hudson and East Rivers. From Brooklyn and Queens, people may cross the Ed Koch Queensboro, Williamsburg, Manhattan, and Brooklyn Bridges by bicycle or on foot. There is no direct bicycle or pedestrian access between New Jersey and the Manhattan CBD as pedestrians are prohibited from the tunnel crossings.[14]

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13 New York Metropolitan Transportation Council. January 2021. *Hub Bound Travel Data Report 2019.* https://www.nymtc.org/Portals/0/Pdf/Hub%20Bound/2019%20Hub%20Bound/DM_TDS_Hub_Bound_Travel_2019.pdf?ver=GS5smEoyHSsHsyX_t_Zriw%3d%3d.

14 Pedestrians and bicyclists are permitted to cross the George Washington Bridge and can reach the Manhattan CBD using the Hudson River Greenway or one of Manhattan's north–south avenues.

4A. Regional Transportation Effects and Modeling

4A.1 OVERVIEW AND CONTEXT

This subchapter describes the reasonably expected effects of implementing the CBD Tolling Alternative on the regional transport system, including travel demand and mode choice. It provides a description of the Best Practice Model (BPM)—the travel demand forecasting model that the New York Metropolitan Transportation Council (NYMTC) developed and maintains—and explains how the model was used to forecast the reasonably expected effects of the Project. The model results show changes in the region's travel characteristics, and specifically how trips would be made to, from, through, and around the Manhattan CBD, including any changes in the total number of trips, routes, and mode choice. The analysis of traffic impacts and mitigation, effects on transit usage, parking, pedestrians, and bicycle usage are based on outputs from these BPM forecasts, and they are evaluated in detail in other subchapters of **Chapter 4, "Transportation."**

4A.2 METHODOLOGY

This analysis is based on a compilation of existing travel characteristics and forecasts of changes in travel demand using the BPM, which is the primary tool used to analyze the effects of large-scale regional transportation projects including, the New York metropolitan area's Federally recognized Regional Transportation Plan, PANYNJ Bus Terminal Redesign, and New NY Bridge Project. The model has been adopted by NYMTC's member agencies for use in regional transportation planning analyses, and it is the Federally recognized transportation forecasting tool for the region. Transportation findings from the BPM were augmented with information from academic studies and observed changes from similar cordon tolling programs in London, England, and Stockholm, Sweden.[1]

4A.2.1 Overview of Best Practice Model

The NYMTC version of the BPM used for this study was developed for NYMTC's 2017 Regional Transportation Plan and Federal air quality conformity determination. It includes the 28 counties that this EA uses for the study area (**Figure 4A-1**). NYMTC regularly updates and calibrates the BPM as part of its regional transportation planning responsibilities, including updating the model's demographic data, future employment and population projections, and changes in the underlying transportation network.

[1] London and Stockholm were chosen as comparative cities based on the scale and scope of their congestion charging programs. Congestion charging programs in these cities offer the most similarities to the proposed CBD Tolling Program. Additional cities in Europe and Asia (e.g., Milan [Italy] and Singapore) have congestion charging programs, but the programs in these cities differ in substantive ways from the proposed CBD Tolling Program. For example, the Milan program bans late-model high-pollution vehicles from the charging zone altogether. Social context is also important for comparative analysis where differing government and social norms may result in contrasting outcomes from a congestion charge.

Figure 4A-1. The Best Practice Model 28-County Region

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network
Note: The shades of purple, green, and pink reinforce the county boundaries for New York, New Jersey, and Connecticut, respectively.

The BPM includes roadway and transit networks and land use data (observed and forecast) for 2010,[2] 2017, 2020, and 2045. For the Project, NYMTC's 2020 BPM roadway and transit networks and land use data were used as the basis to forecast the effects of the CBD Tolling Alternative in the opening year (2023) because it provides the most recent pre-COVID-19-pandemic data, including but not limited to 2019 traffic counts. In addition, as described in Chapter 1, "Introduction," pre-COVID-19-pandemic baseline conditions are considered the appropriate way to define near-term 2023 No Action Alternative conditions as the region rebounds and to forecast to 2045, a horizon year that reflects a long-term condition not biased by periodic disruptions.[3, 4] The roadway networks from NYMTC were updated to include projects that have been implemented or constructed but were not included in the original BPM roadway networks from NYMTC (e.g., two-way tolling on the Verrazzano-Narrows Bridge, reduced lane capacity on the Brooklyn-Queens Expressway near Brooklyn Heights, and bike lane projects like the Brooklyn Bridge bike lane) in the opening (2023) and horizon (2045) years.

The BPM is an activity-based model that simulates the number and types of journeys[5] made on an average weekday in the region by each resident. The BPM does not model or forecast weekend travel or other atypical days such as Gridlock Alert days.[6] This creates a realistic analysis that is based on the various decisions (e.g., mode, purpose, destination, frequency, location of intermediate stops, and time of day) made by travelers between these locations informed by employment and demographic data from NYMTC. The BPM generates over 28.8 million journeys per average weekday from the 28-county region's 8.2 million households.

For vehicular modes, the BPM roadway networks contain more than 61,000 links that include local streets, interstates, and freeways, and more than 4,600 Traffic Analysis Zones (TAZs).[7] For each roadway link, the BPM roadway networks contain information on the number of lanes, functional class,[8] speed, truck usage, and toll collection. The opening year and horizon year roadway and transit networks are used to estimate travel times and distances between all parts of the region—from each TAZ to every other TAZ. The roadway and transit networks are also used to assign travel demand flows to roadways and transit routes to produce roadway volumes, speeds, and transit boardings and alightings. Roadway volumes can be reported by the following vehicle classes:

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2 This version of the BPM is calibrated to 2010 conditions because the regional household travel survey upon which the BPM is based was conducted in 2010.

3 The 2023 and 2045 transportation networks for the No Action Alternative include the planned improvements documented in the Regional Transportation Plan, adopted in June 2017. Source: New York Metropolitan Transportation Council. June 2017. *Plan 2045: Maintaining the Vision for a Sustainable Region*.

4 The horizon year is typically defined as the year for which a transportation plan describes the envisioned transportation system. This is typically the last year of a metropolitan region's 20-year regional transportation plan. The last year analyzed in the New York Metropolitan Transportation Council's adopted 2017 Regional Transportation Plan is 2045.

5 A journey is defined as round-trip travel between principal locations like home and anchor locations such as work, school, retail, or entertainment. The BPM also estimates related trips linked to the anchor travel location (e.g., intermediate stops such as a day care center or gym).

6 Most regional travel demand models in the United States forecast only average weekday travel behavior. In the New York region, weekend travel is less than weekday travel. To derive annual estimates of travel and air quality metrics, annualization factors derived from observed data are used to extrapolate average weekday trends to average annual trends.

7 TAZs are approximately the size of U.S. Census Block Groups in the BPM. TAZs are used to aggregate travel origins and destinations to computationally manageable sizes for roadway and transit assignment procedures.

8 Functional classification describes roadway design, including its speed, capacity, and relationship to existing and future land use development.

- Single-occupancy vehicles[9, 10]
- High-occupancy vehicles (HOV) (of a minimum of two or more occupants)
- Taxis (including FHVs)[11]
- Medium trucks, heavy trucks, and commercial vans
- Buses[12]

For transit modes, the BPM contains all the routes, stations/stops, service frequencies, and fares for transit service throughout the metropolitan region, including the following:

- MTA subway, bus, and commuter rail
- NJ Transit Corporation (NJ TRANSIT) commuter rail, light rail, and bus
- Port Authority Trans-Hudson (PATH) rail service
- Ferries
- Other public buses such as the Westchester Bee-Line and Nassau Inter-County Express
- Private transit bus operators[13]

The model also generates an estimate of travel demand based on how people travel to their destination and from their origin (walk,[14] drive) or any transfers between routes for commuter rail, subway, light rail, bus, ferry, and tramway.

4A.2.2 Modeling of Toll Rates

Because the actual tolls will be determined through a process subsequent to the completion of this EA, the BPM modeling for this effort makes use of seven tolling scenarios within the CBD Tolling Alternative, each with a different set of variable toll rates and different exemptions, discounts, and/or crossing credits. Tolls are an explicit model input. Through this set of tolling scenarios, the modeling captures the full range of potential effects from the Project (see Table 2-3 and Table 2-5 in Chapter 2, "Project Alternatives," for a description of the tolling scenarios evaluated).[15] In addition, the BPM represents the cost sensitivity of

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9 Occupancy in this context refers to the number of people in the vehicle during the trip. It is not a reference to the occupant capacity of the vehicle.

10 In the BPM, motorcycles are considered personal vehicles, and they are included in the model's representation of single- and high-occupancy vehicles along with cars, trucks, sport-utility vehicles, and other personal vehicles. Motorcycles comprise less than 0.5 percent of overall traffic entering the Manhattan CBD at TBTA facilities.

11 FHVs provide pre-arranged transportation. There are four classes of FHV services: Community Cars (Liveries), Black Cars, Luxury Limousines, and High Volume For-Hire Services. Prominent examples of High Volume For-Hire Services include Lyft, Uber, and Via.

12 Bus volumes in the BPM reflect the estimated number of transit buses on a roadway link based on transit operating schedules.

13 The BPM includes private bus operators (not jitneys) that provide contracted transit services to a public transit agency, for example, Suburban Transit service on behalf of NJ TRANSIT in Middlesex County. The BPM also includes private, regular commuter services to Manhattan like commuter express services from New Jersey, Long Island, and the New York counties north of New York City (e.g., Academy, Lakeland, Coach USA).

14 Walk includes all nonmotorized access to the transit system including bicycles.

15 As described in Chapter 2, "Project Alternatives," this Environmental Assessment (EA) evaluates multiple tolling scenarios to identify the range of potential effects that would occur from implementing the Project. These tolling scenarios have a range of different toll amounts and toll structures, such as crossing credits, discounts, and/or exemptions. Ultimately, the TBTA Board will determine the toll amounts and toll structure to be implemented.

various travelers in response to tolling. The assumptions that drive these sensitivities are described in Appendix 4A.1, "Transportation: Section 4A.1-7. Value of Time."

4A.3 EVALUATING THE PROJECT

Results from the BPM for the No Action Alternative and the seven tolling scenarios were used to evaluate the effects of the CBD Tolling Alternative. This subchapter focuses on key findings from the BPM analysis and regional changes in travel behavior across the 28 counties included in the BPM (see Figure 4A-1). More detailed results on local roads, highways, local intersections, transit, bicycles, pedestrians, and parking are described and discussed in Subchapter 4B through Subchapter 4E across the 28-county region.

A detailed summary of the BPM outputs for the No Action Alternative and CBD Tolling Alternative (including the tolling scenarios) is provided in Appendix 4A.2, "Transportation: Travel Forecast Tolling Scenario Summaries and Detailed Tables,". In all tables presented here, unless noted, the term "vehicle" in this chapter refers to all on-road vehicles, including single-occupancy vehicles, HOVs, motorcycles, taxis, FHVs,[16] buses, and trucks.

Three metrics were used to summarize and compare the forecasts of the No Action Alternative and the CBD Tolling Alternative in this subchapter:

1. Daily Vehicles Entering the Manhattan CBD: This metric conveys the change in the number of vehicles that would cross into the Manhattan CBD as a result of the different tolling scenarios, and how those changes would vary geographically. Table 4A-1, Table 4A-4, Table 4A-5, Table 4A-11, and Table 4A-12 report the number of vehicle crossings into the Manhattan CBD as described below:
   - New Jersey Crossings: Lincoln and Holland Tunnels
   - Brooklyn Crossings: Williamsburg, Manhattan, and Brooklyn Bridges and the Hugh L. Carey Tunnel
   - Queens Crossings: Ed Koch Queensboro Bridge[17] and Queens-Midtown Tunnel
   - 60th Street Crossings in Manhattan (divided into three groupings):
     - East Side avenues
     - West Side avenues
     - Franklin D. Roosevelt (FDR) Drive and the West Side Highway/Route 9A (combined volumes)[18]

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16 Since the BPM does not distinguish between taxis and FHVs, taxi and FHV maximum CBD toll rates were blended to evaluate policy differences in tolling. Appendix 4A.1, "Transportation: Implementation of Tolls in the Best Practice Model," provides a more detailed discussion of modeling taxi and FHV travel.

17 The Manhattan-bound upper ramp of the Queensboro Bridge is considered part of the Queens-inbound crossing locations to the Manhattan CBD, and it is also reported in the 60th Street outbound crossing locations. Currently, all Manhattan-bound traffic enters the bridge via the northern upper-level lanes of the Ed Koch Queensboro Bridge and enters the Manhattan CBD but immediately exits the Manhattan CBD on the northbound ramp to 62nd Street (except for AM peak-period HOV lanes that use the southern lanes, typically reserved for outbound traffic, which enter the Manhattan CBD at 59th Street). The Queensboro Bridge entrances and exits are consistent with the NYMTC *Hub Bound Travel Data Report*. All traffic using the northern upper roadway of the Ed Koch Queensboro Bridge to access Manhattan north of 60th Street would not be subject to CBD tolling in the tolling scenarios modeled in this EA.

18 Vehicles traveling south of 60th Street on the West Side Highway/Route 9A and the FDR Drive would not be charged a CBD toll if they remain on these roadways and do not enter the Manhattan CBD.

DOT_0036344

2. **Daily VMT:** The analysis conveys the change in the aggregate level of driving or traffic that would occur within the BPM's modeled area. Table 4A-2, Table 4A-6, Table 4A-7, Table 4A-13, and Table 4A-14 report the quantity of VMT (i.e., total miles traveled by vehicles) forecast in each reporting area. Changes in VMT are correlated with changes in level of service, air quality, and noise discussed in Subchapter 4B, "Highways and Local Intersections," Chapter 10, "Air Quality," and Chapter 12, "Noise."

   Figure 4A-2 displays the reporting subareas used within New York City (NYC Subareas 1, 2, and 3). The subareas are defined based on their proximity to the Manhattan CBD entry and exit locations. The Manhattan CBD comprises the surface streets within the CBD, referred to below as the CBD Core and the highways that circumnavigate the surface streets, referred to as the Peripheral Highways. The Peripheral Highways include:

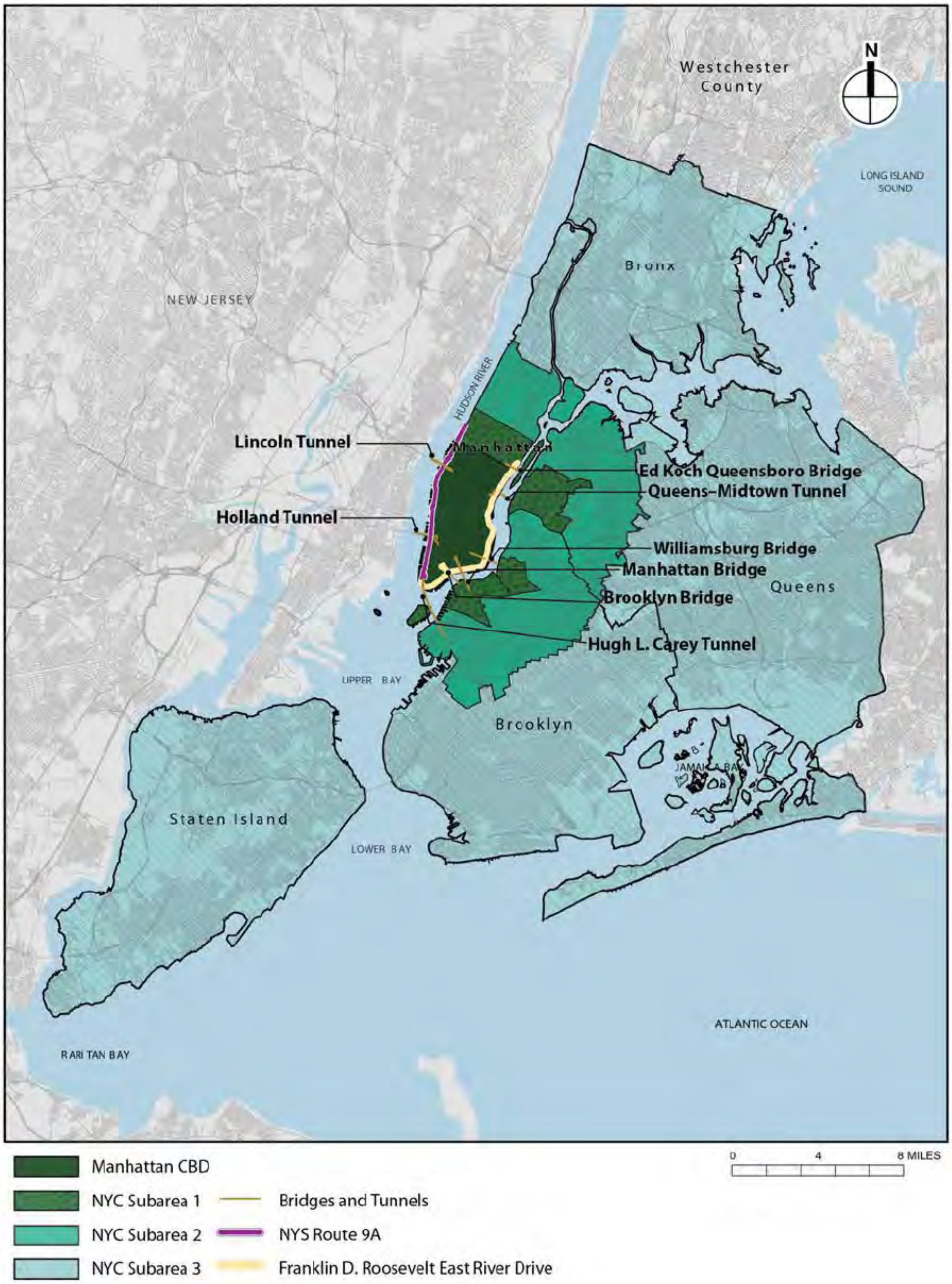
   – West Side Highway/Route 9A south of 60th Street
   – FDR Drive south of 60th Street, including the Battery Park Underpass
   – Lincoln, Holland, Hugh L. Carey, and Queens-Midtown Tunnels
   – Brooklyn, Manhattan, Williamsburg, and Ed Koch Queensboro Bridges

   Outside New York City, VMT is reported for the remaining seven New York counties that are inside the BPM boundary: Nassau County and Suffolk County on Long Island and five counties to the north of New York City (Dutchess, Orange, Putnam, Rockland, and Westchester). In Connecticut, VMT is reported for Fairfield and New Haven Counties. In New Jersey, VMT is reported for the 14 northeastern counties. (See Figure 4A-1 for a map of the 28 counties in the BPM.)

3. **Mode Shares for Manhattan CBD-Related Person-Journeys.** The analysis conveys the share of journeys that would be made by transit, auto, and nonmotorized (walk and bike) travel modes related to the Manhattan CBD. Manhattan CBD-related journeys are those with one or both ends of the journey inside the Manhattan CBD. These metrics are reported in Table 4A-3, Table 4A-8, and Table 4A-15.

   Table 4A-8 and Table 4A-15 report changes in the percentage share of transit ***[, auto, and nonmotorized]*** journeys that would originate outside and travel into the Manhattan CBD; journeys that would originate inside and travel out of the Manhattan CBD; and journeys that would be completely internal to the Manhattan CBD. Transit share reported is the number of people who would make a transit journey—including via subway, commuter rail, buses, ferries, and trams—as a percentage of people who would travel by all motorized vehicles and nonmotorized modes such as walking and biking.

Figure 4A-2. Reporting Locations in New York City for Additional Vehicle-Miles Traveled



Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Roadway Network

4A.4 ENVIRONMENTAL CONSEQUENCES

4A.4.1 No Action Alternative

This section presents the predicted changes in regional travel patterns between the opening year (2023) and the horizon year (2045) for the No Action Alternative. The 2023 and 2045 transportation networks for the No Action Alternative include the planned improvements documented in the Regional Transportation Plan, adopted in June 2017.[19] Additional network updates (described in **Appendix 4A.1, "Transportation: Implementation of Tolls in the Best Practice Model," Table 4A.1-3**) were implemented to reflect existing conditions as of September 2021.[20] Land use, population, and employment assumptions come from the NYMTC Socioeconomic and Demographic Forecasts. NYMTC routinely develops these forecasts for the region, which include population, households, employment, and labor force projections.

With these assumptions, BPM-generated forecasts show a 4.8 percent increase (about 0.25 percent per year) in daily vehicles entering the Manhattan CBD (**Table 4A-1**) between 2023 and 2045. The largest absolute increase would occur on the 60th Street crossings, with an additional 12,410 vehicle trips.

Table 4A-1. Forecast Growth in Daily Vehicles Entering the Manhattan CBD: No Action Alternative

CROSSING LOCATIONS	OPENING YEAR (2023)	HORIZON YEAR (2045)	DIFFERENCE	PERCENTAGE CHANGE
60th Street	**276,466**	**288,876**	**12,410**	**4.5%**
FDR Drive and West Side Highway/Route 9A[1]	161,696	168,499	6,803	4.2%
West Side Avenues	28,026	31,920	3,894	13.9%
East Side Avenues[2]	86,744	88,457	1,713	2.0%
Queens	**142,596**	**154,348**	**11,752**	**8.2%**
Brooklyn	**187,486**	**192,604**	**5,118**	**2.7%**
New Jersey	**109,602**	**114,867**	**5,265**	**4.8%**
TOTAL	**716,150**	**750,695**	**34,545**	**4.8%**

1 Vehicle volumes entering the Manhattan CBD reported in this table for the FDR Drive and the West Side Highway/Route 9A and are all vehicles traveling south on these facilities at 60th Street regardless of whether the vehicle eventually enters the Manhattan CBD from one of these facilities. Some vehicles reported in this table may use the FDR Drive and the West Side Highway/Route 9A to access the Hugh L. Carey Tunnel or Brooklyn Bridge without ever entering the Manhattan CBD. The volumes here are reported in this manner to be consistent with counts published in the annual NYMTC *Hub Bound Travel Data Report*.

2 The larger volumes in East Side avenues result from some Queensboro Bridge traffic being counted twice. The NYMTC *Hub Bound Travel Data Report* cordon includes the upper inbound roadway as a Manhattan CBD outbound tolling zone boundary. Any traffic that would then circle back into the Manhattan CBD via Second Avenue or York Avenue would be recounted as a Manhattan CBD inbound trip.

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19 New York Metropolitan Transportation Council. June 2017. *Plan 2045: Maintaining the Vision for a Sustainable Region*.

20 Modeling of tolling scenarios commenced on September 2021; therefore, any road network changes since then are not included in this analysis.

Table 4A-2 summarizes the changes in forecast daily VMT for all vehicles under the No Action Alternative. In the No Action Alternative, VMT is forecast to grow by 8.8 percent regionwide between 2023 and 2045. In the Manhattan CBD, VMT is forecast to grow by 4.9 percent. The largest increases in VMT would be on Long Island and in the five New York counties north of New York City. For the New Jersey counties in the model area, VMT would increase by 10.6 percent (an increase of more than 10 million VMT on an average weekday). For the 12 New York State counties in the model area, VMT would increase by nearly 12 million VMT (9.8 percent). New York City's subareas are expected to see increases in daily VMT in the range of 5.3 percent to 7.2 percent.

In 2045, the No Action Alternative would have a 1.2 percent increase in Manhattan CBD-related transit mode share—from 61.7 percent to 62.9 percent transit share. This growth would be driven primarily by journeys that begin outside the Manhattan CBD (Table 4A-3).

4A.4.2 2023 CBD Tolling Alternative

Travel forecasts were prepared for the opening year (2023) and horizon year (2045) for the CBD Tolling Alternative for each of the seven tolling scenarios (see Chapter 2, "Project Alternatives," for more information on the tolling scenarios). The results of these forecasts were compared with the No Action Alternative to assess the effects of each tolling scenario. Appendix 4A.2, "Transportation: Travel Forecast Tolling Scenario Summaries and Detailed Tables," provides detailed statistics for each of the forecasts. This section summarizes key metrics for 2023.

Table 4A-4 and Table 4A-5 show the change in vehicles that would enter or pass through the Manhattan CBD. Absolute volumes and percentage change compared to the No Action Alternative are shown. The larger reductions on the East Side avenues compared to the West Side avenues are a result of changing volumes on the upper level of the Ed Koch Queensboro Bridge. Tolling Scenarios C through F all offer some form of crossing credits for the Queens-Midtown Tunnel. The crossing credits increase the attractiveness of the TBTA East River facilities compared to the Ed Koch Queensboro Bridge and divert crossings destined for the Manhattan CBD off the bridge and onto TBTA facilities. With fewer Manhattan CBD-bound vehicles using the upper level of the bridge, traffic would be reduced on the East Side avenues into the Manhattan CBD at greater levels than the West Side avenues.

Table 4A-2. Forecast Growth in All Vehicle Daily Vehicle-Miles Traveled: No Action Alternative

LOCATION	OPENING YEAR (2023)	HORIZON YEAR (2045)	GROWTH FROM 2023 TO 2045	PERCENTAGE CHANGE
New York Counties	**122,186,497**	**134,186,361**	**11,999,864**	**9.8%**
New York City	47,131,752	49,748,914	2,617,162	5.6%
Manhattan CBD	3,244,791	3,402,711	157,920	4.9%
CBD Core	1,217,727	1,262,019	44,292	3.6%
Peripheral Highways (south of 60th Street; excluded from the toll)	2,027,064	2,140,692	113,628	5.6%
West Side Highway/Route 9A	610,657	647,671	37,014	6.1%
FDR Drive	720,682	758,659	37,977	5.3%
Bridges and Tunnels*	695,725	734,362	38,637	5.6%
NYC Subarea 1 (see Figure 4A-2)	2,218,077	2,349,929	131,852	5.9%
NYC Subarea 2 (see Figure 4A-2)	6,660,953	7,142,863	481,910	7.2%
NYC Subarea 3 (see Figure 4A-2)	35,007,931	36,853,411	1,845,480	5.3%
Long Island Counties (2)	**41,585,545**	**46,813,526**	**5,227,981**	**12.6%**
New York Counties North of New York City (5)	**33,469,200**	**37,623,921**	**4,154,721**	**12.4%**
New Jersey Counties (14)	**97,578,100**	**107,907,842**	**10,329,742**	**10.6%**
Connecticut Counties (2)	**34,909,870**	**35,063,470**	**153,600**	**0.4%**
TOTAL	**254,674,467**	**277,157,673**	**22,483,206**	**8.8%**

Note: The number of counties are indicated within parentheses ( ).
* Bridge and tunnel traffic includes VMT from the portion of bridges and tunnels in New York County (Manhattan) entering the Manhattan CBD from Kings County (Brooklyn), Queens, and New Jersey.

Table 4A-3. Changes in Manhattan CBD Total Daily Mode Share: No Action Alternative

DIRECTION OF JOURNEY	OPENING YEAR (2023)	HORIZON YEAR (2045)	PERCENTAGE POINT CHANGE
Journeys Beginning Outside the Manhattan CBD	**1,920,016**	**2,056,665**	
Auto (including HOV, Taxi, FHV)	19.1%	17.7%	-1.4%
Transit	78.2%	79.7%	1.5%
Walk and Bike	2.7%	2.6%	-0.1%
Journeys Beginning Inside the Manhattan CBD	**159,183**	**173,345**	
Auto (including HOV, Taxi, FHV)	30.2%	29.7%	-0.5%
Transit	51.5%	52.1%	0.6%
Walk and Bike	18.3%	18.2%	-0.1%
Journeys Within the Manhattan CBD	**875,418**	**916,741**	
Auto (including HOV, Taxi, FHV)	7.1%	6.9%	-0.2%
Transit	27.5%	27.4%	-0.1%
Walk and Bike	65.4%	65.7%	0.3%
All Manhattan CBD-Related Journeys	**2,954,617**	**3,146,751**	
Auto (including HOV, Taxi, FHV)	16.2%	15.3%	-0.9%
Transit	61.7%	62.9%	1.2%
Walk and Bike	22.1%	21.8%	-0.3%

Note: Trucks are excluded from mode share calculations

Table 4A-4. Daily Vehicles[1] Entering the Manhattan CBD by Crossing Location: No Action Alternative and Tolling Scenarios (2023)

CROSSING LOCATION	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
60th Street	**276,466**	**220,659**	**221,318**	**208,405**	**198,437**	**196,294**	**204,011**	**216,999**
FDR Drive and West Side Highway/Route 9A[2]	161,696	151,594	152,322	146,846	141,979	140,589	144,802	150,734
West Side Avenues	28,026	22,265	22,743	20,793	19,710	19,467	20,410	22,105
East Side Avenues	86,744	46,800	46,253	40,766	36,748	36,238	38,799	44,160
Queens	**142,596**	**125,030**	**124,315**	**130,029**	**136,799**	**136,652**	**137,229**	**123,298**
Brooklyn	**187,486**	**168,154**	**167,624**	**152,790**	**138,880**	**137,092**	**137,368**	**165,509**
New Jersey	**109,602**	**92,070**	**90,704**	**100,791**	**107,810**	**103,257**	**106,560**	**88,196**
TOTAL	**716,150**	**605,913**	**603,961**	**592,015**	**581,926**	**573,295**	**585,168**	**594,002**

1 Unless noted, the term "vehicles" in this subchapter refers to all on-road vehicles, including single-occupancy vehicles, HOVs, motorcycles, taxis, FHVs, buses, and trucks.
2 In this table, vehicle volumes reported as entering the Manhattan CBD on the FDR Drive and the West Side Highway/Route 9A are all vehicles traveling south on these facilities at 60th Street regardless of whether the vehicle eventually enters the Manhattan CBD from one of these facilities. Some vehicles reported in this table may use the West Side Highway/Route 9A and the FDR Drive to access the Hugh L. Carey Tunnel or Brooklyn Bridge without ever entering the Manhattan CBD. These volumes are reported in this manner to be consistent with how vehicle count data is published in the annual NYMTC *Hub Bound Travel Data Report*.

Table 4A-5. Percentage Change (compared to No Action Alternative) in Daily Vehicles Entering the Manhattan CBD by Crossing Location and Tolling Scenario (2023)

CROSSING LOCATIONS	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
60th Street	**-20.2%**	**-19.9%**	**-24.6%**	**-28.2%**	**-29.0%**	**-26.2%**	**-21.5%**
FDR Drive and West Side Highway/Route 9A*	-6.2%	-5.8%	-9.2%	-12.2%	-13.1%	-10.4%	-6.8%
West Side Avenues	-20.6%	-18.9%	-25.8%	-29.7%	-30.5%	-27.2%	-21.1%
East Side Avenues	-46.0%	-46.7%	-53.0%	-57.6%	-58.2%	-55.3%	-49.1%
Queens	**-12.3%**	**-12.8%**	**-8.8%**	**-4.1%**	**-4.2%**	**-3.8%**	**-13.5%**
Brooklyn	**-10.3%**	**-10.6%**	**-18.5%**	**-25.9%**	**-26.9%**	**-26.7%**	**-11.7%**
New Jersey	**-16.0%**	**-17.2%**	**-8.0%**	**-1.6%**	**-5.8%**	**-2.8%**	**-19.5%**
TOTAL	**-15.4%**	**-15.7%**	**-17.3%**	**-18.7%**	**-19.9%**	**-18.3%**	**-17.1%**

* In this table, vehicle volumes reported as entering the Manhattan CBD on the FDR Drive and the West Side Highway/Route 9A are all vehicles traveling south on these facilities at 60th Street regardless of whether the vehicle eventually enters the Manhattan CBD from one of these facilities. Some vehicles reported in this table may use the West Side Highway/Route 9A and the FDR Drive to access the Hugh L. Carey Tunnel or Brooklyn Bridge without ever entering the Manhattan CBD. These volumes are reported in this manner to be consistent with how vehicle count data is published in the annual NYMTC *Hub Bound Travel Data Report*.

While all the tolling scenarios within the CBD Tolling Alternative would reduce traffic entering the Manhattan CBD, the largest total reduction would occur with Tolling Scenario E. Tolling Scenario E would also result in the largest reduction of vehicle crossings into the Manhattan CBD from Upper Manhattan at 60th Street and Brooklyn, while Tolling Scenario G would result in the largest reduction of vehicles crossing into the Manhattan CBD from Queens and New Jersey.

Changes in daily VMT by tolling scenario are shown in Table 4A-6 (absolute values) and Table 4A-7 (percentage change compared to the No Action Alternative). Consistent with changes in vehicles entering the Manhattan CBD, the largest reduction in regional VMT and VMT in New York City would occur under Tolling Scenario E. The greatest reduction in VMT on a percentage basis would occur on the West Side Highway/Route 9A south of 60th Street, with a maximum reduction of 20.5 percent under Tolling Scenario D. New York City Subarea 3 would have an increase in VMT under Tolling Scenarios A, B, C, and G of less than 0.1 percent to 0.3 percent. VMT on the FDR Drive would increase south of 60th Street in Tolling Scenario A, B, F, and G because of travelers seeking a free path around the Manhattan CBD using the FDR Drive and untolled ramps to the Brooklyn Bridge. VMT would increase by less than 0.2 percent in New Jersey in all tolling scenarios, mostly in Bergen and Middlesex Counties, from increased diversions to and from the George Washington Bridge and Outerbridge Crossing for through-trips avoiding the Manhattan CBD toll.

Table 4A-8 shows how many journeys would shift from passenger vehicles to transit and walking and biking for Manhattan CBD-related journeys. Changes are shown separately for journeys that originate outside and travel into the Manhattan CBD, journeys that originate inside and travel out of the Manhattan CBD, and journeys that are completely internal to the Manhattan CBD.

In all tolling scenarios, some Manhattan CBD-related journeys would shift to transit. Tolling Scenarios D and E would have the largest shift to transit (an increase in transit journeys up to 2.3 percent) to and from the Manhattan CBD. Transit journeys entirely within the Manhattan CBD would change 1 percent or less for all tolling scenarios (see Table 4A-8). Walking and biking trips would also increase slightly (up to 0.14 percent).

Table 4A-9 breaks down the numbers of Manhattan CBD-related journeys for private vehicles (drive alone and HOVs), taxis, and FHVs. Table 4A-10 shows the shift in all Manhattan CBD-related transit journeys by tolling scenario.

Table 4A-6. Daily Vehicle-Miles Traveled: No Action Alternative and CBD Tolling Alternative, by Tolling Scenario (2023)

LOCATIONS	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York Counties	**122,186,497**	**121,752,302**	**121,789,089**	**121,438,634**	**121,227,956**	**121,111,122**	**121,464,091**	**121,662,622**
New York City	47,131,752	46,743,670	46,784,237	46,572,720	46,461,121	46,404,913	46,578,412	46,713,541
Manhattan CBD	3,244,791	2,993,214	2,998,489	2,984,080	2,963,211	2,946,339	3,016,013	2,970,819
CBD Core	1,217,727	1,150,843	1,152,471	1,161,407	1,159,162	1,147,545	1,183,476	1,142,077
Peripheral Highways (south of 60th Street; excluded from the toll)	2,027,064	1,842,371	1,846,018	1,822,673	1,804,049	1,798,794	1,832,537	1,828,742
West Side Highway/Route 9A	610,657	510,785	513,887	493,396	485,167	486,404	501,603	508,951
FDR Drive	720,682	725,459	729,706	718,820	705,903	710,555	721,421	727,101
Bridges & Tunnels	695,725	606,127	602,425	610,457	612,979	601,835	609,513	592,690
NYC Subarea 1 (see Figure 4A-2)	2,218,077	2,049,561	2,049,528	2,004,366	1,955,714	1,944,168	1,962,310	2,031,243
NYC Subarea 2 (see Figure 4A-2)	6,660,953	6,626,001	6,630,016	6,588,313	6,578,676	6,568,162	6,596,549	6,615,308
NYC Subarea 3 (see Figure 4A-2)	35,007,931	35,074,894	35,106,204	34,995,961	34,963,520	34,946,244	35,003,540	35,096,171
Long Island Counties (2)	**41,585,545**	**41,609,407**	**41,595,736**	**41,546,248**	**41,503,705**	**41,497,676**	**41,598,789**	**41,573,420**
New York Counties North of New York City (5)	**33,469,200**	**33,399,225**	**33,409,116**	**33,319,666**	**33,263,130**	**33,208,533**	**33,286,890**	**33,375,661**
New Jersey Counties (14)	**97,578,100**	**97,594,939**	**97,590,826**	**97,748,567**	**97,733,034**	**97,665,181**	**97,768,338**	**97,642,310**
Connecticut Counties (2)	**34,909,870**	**34,878,673**	**34,856,848**	**34,830,279**	**34,846,493**	**34,842,671**	**34,893,239**	**34,844,682**
TOTAL	**254,674,467**	**254,225,914**	**254,236,763**	**254,017,480**	**253,807,483**	**253,618,974**	**254,125,668**	**254,149,614**

Notes:
1. The number of counties are indicated within parentheses ( ).
2. Unless noted, the terms “Vehicle-Miles Traveled” or “VMT” in this subchapter refer to miles traveled by all on-road vehicles, including single-occupancy vehicles, HOVs, motorcycles, taxis, FHVs, buses, and trucks.

Table 4A-7. Percentage Change (compared to No Action Alternative) in Daily Vehicle-Miles Traveled by Tolling Scenario (2023)

LOCATIONS	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York Counties	**-0.4%**	**-0.3%**	**-0.6%**	**-0.8%**	**-0.9%**	**-0.6%**	**-0.4%**
New York City	-0.8%	-0.7%	-1.2%	-1.4%	-1.5%	-1.2%	-0.9%
Manhattan CBD	-7.8%	-7.6%	-8.0%	-8.7%	-9.2%	-7.1%	-8.4%
CBD Core	-5.5%	-5.4%	-4.6%	-4.8%	-5.8%	-2.8%	-6.2%
Peripheral Highways (south of 60th Street; excluded from the toll)	-9.1%	-8.9%	-10.1%	-11.0%	-11.3%	-9.6%	-9.8%
West Side Highway/Route 9A	-16.4%	-15.8%	-19.2%	-20.5%	-20.3%	-17.9%	-16.7%
FDR Drive	0.7%	1.3%	-0.3%	-2.1%	-1.4%	0.1%	0.9%
Bridges & Tunnels	-12.9%	-13.4%	-12.3%	-11.9%	-13.5%	-12.4%	-14.8%
NYC Subarea 1 (see Figure 4A-2)	-7.6%	-7.6%	-9.6%	-11.8%	-12.3%	-11.5%	-8.4%
NYC Subarea 2 (see Figure 4A-2)	-0.5%	-0.5%	-1.1%	-1.2%	-1.4%	-1.0%	-0.7%
NYC Subarea 3 (see Figure 4A-2)	0.2%	0.3%	0.0%	-0.1%	-0.2%	0.0%	0.3%
Long Island Counties (2)	**0.1%**	**0.0%**	**-0.1%**	**-0.2%**	**-0.2%**	**0.0%**	**0.0%**
New York Counties North of New York City (5)	**-0.2%**	**-0.2%**	**-0.4%**	**-0.6%**	**-0.8%**	**-0.5%**	**-0.3%**
New Jersey Counties (14)	**0.0%**	**0.0%**	**0.2%**	**0.2%**	**0.1%**	**0.2%**	**0.1%**
Connecticut Counties (2)	**-0.1%**	**-0.2%**	**-0.2%**	**-0.2%**	**-0.2%**	**0.0%**	**-0.2%**
TOTAL	**-0.2%**	**-0.2%**	**-0.3%**	**-0.3%**	**-0.4%**	**-0.2%**	**-0.2%**

Note: The number of counties are indicated within parentheses ( ).

Table 4A-8. Daily Manhattan CBD Journey Mode Share (compared to No Action Alternative) by Tolling Scenario (2023)

DIRECTION OF JOURNEY	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Beginning Outside the Manhattan CBD								
Auto (including HOV, Taxi, FHV)	19.1%	18.0%	18.1%	17.7%	17.0%	16.8%	17.3%	17.7%
Transit	78.2%	79.3%	79.2%	79.6%	80.3%	80.5%	80.0%	79.6%
Walk and Bike	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%	2.7%
Change in Transit Share		1.1%	1.0%	1.4%	2.1%	2.3%	1.8%	1.4%
Beginning Inside the Manhattan CBD								
Auto (including HOV, Taxi, FHV)	30.2%	28.9%	29.0%	28.5%	27.6%	27.6%	28.2%	27.9%
Transit	51.5%	52.4%	52.3%	52.6%	53.4%	53.4%	52.9%	53.6%
Walk and Bike	18.3%	18.7%	18.7%	18.9%	19.0%	19.0%	18.9%	18.5%
Change in Transit Share		0.9%	0.8%	1.1%	1.9%	1.9%	1.4%	2.1%
Beginning and Ending Within the Manhattan CBD								
Auto (including HOV, Taxi, FHV)	7.1%	7.1%	7.2%	7.2%	7.2%	7.1%	7.1%	7.3%
Transit	27.5%	27.5%	27.3%	27.5%	27.6%	27.6%	27.5%	27.7%
Walk and Bike	65.4%	65.4%	65.5%	65.3%	65.2%	65.3%	65.4%	65.0%
Change in Transit Share		0.0%	-0.2%	0.0%	0.1%	0.1%	0.0%	0.2%
All Manhattan CBD-Related Journeys								
Auto (including HOV, Taxi, FHV)	16.2%	15.3%	15.5%	15.1%	14.6%	14.5%	14.9%	15.1%
Transit	61.7%	62.5%	62.4%	62.7%	63.2%	63.3%	63.0%	62.8%
Walk and Bike	22.1%	22.2%	22.1%	22.2%	22.2%	22.2%	22.1%	22.1%
Change in Transit Share		0.8%	0.7%	1.0%	1.5%	1.6%	1.3%	1.1%

Note: Table includes only journeys made by single-occupancy vehicles, HOVs, taxis, FHVs, motorcycles, public transit, bicycle, and walking, but does not include commercial trucks.

Table 4A-9. Daily Manhattan CBD-Related Auto-Based Vehicle Person-Journeys (compared to No Action Alternative) by Tolling Scenario (2023)

MODE	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Private Vehicles (drive alone and HOVs)	412,721	397,185	393,224	387,136	380,656	370,785	374,743	393,570
	Difference	-15,536	-19,497	-25,585	-32,065	-41,936	-37,978	-19,151
	Percentage	-3.8%	-4.7%	-6.2%	-7.8%	-10.2%	-9.2%	-4.6%
Taxi/FHV	64,695	56,165	64,314	59,995	50,713	57,081	63,737	55,450
	Difference	-8,530	-381	-4,700	-13,982	-7,614	-958	-9,245
	Percentage	-13.2%	-0.6%	-7.3%	-21.6%	-11.8%	-1.5%	-14.3%
TOTAL	**477,416**	**453,350**	**457,538**	**447,131**	**431,369**	**427,866**	**438,480**	**449,020**
	Difference	**-24,066**	**-19,878**	**-30,285**	**-46,047**	**-49,550**	**-38,936**	**-28,396**
	Percentage	**-5.0%**	**-4.2%**	**-6.3%**	**-9.6%**	**-10.4%**	**-8.2%**	**-5.9%**

Table 4A-10. Daily Manhattan CBD-Related Transit Journeys (compared to No Action Alternative) by Tolling Scenario (2023)

NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
1,833,770	1,856,016	1,856,487	1,864,633	1,874,509	1,878,700	1,872,355	1,860,737
Difference	22,246	22,717	30,863	40,739	44,930	38,585	26,967
Percentage	1.2%	1.2%	1.7%	2.2%	2.5%	2.1%	1.5%

4A.4.3 2045 CBD Tolling Alternative

This section compares key measures for the horizon year (2045) forecasts with and without the Project. Manhattan CBD tolls in 2045 are assumed to grow consistent with inflation between 2023 and 2045. Socioeconomic conditions from 2045 are provided by NYMTC and are consistent with the NYMTC 2017 Regional Transportation Plan.

Appendix 4A.2, "Transportation: Travel Forecast Tolling Scenario Summaries and Detailed Tables," provides detailed statistics for each of the forecasts.

Table 4A-11 and Table 4A-12 show the daily vehicles[21] entering or passing through the Manhattan CBD by tolling scenario for 2045. (Absolute number and percentage change compared to the No Action Alternative are shown.) The horizon year (2045) analysis shows results similar to the opening year (2023). The largest total reduction in vehicles entering the Manhattan CBD would occur with Tolling Scenario E. Tolling Scenario E would also result in the largest reduction of vehicle crossings into the Manhattan CBD from Upper Manhattan at 60th Street and Brooklyn, while Tolling Scenario G would result in the largest reduction of vehicles crossing into the Manhattan CBD from Queens and New Jersey.

Table 4A-13 shows the regional VMT by tolling scenario, and **Table 4A-14** shows the percentage change from the No Action Alternative for 2045. Tolling Scenario E would reduce VMT the most at the regional level, across the New York City subareas, and in the Manhattan CBD, the last of which would experience an 8.7 percent reduction in VMT. Localized increases in VMT would be experienced on the FDR Drive south of 60th Street under Tolling Scenarios A, B, and G because travelers would seek a free path around the Manhattan CBD using the FDR Drive and untolled ramps to the Brooklyn Bridge.

Table 4A-15 shows changes in the share of travelers driving, using transit, and walking and biking compared to the No Action Alternative for 2045. For all Manhattan CBD-related journeys, the change in the number of journeys by transit would be between 0.6 percent and 1.5 percent, which represents an increase of 20,000 to 50,000 transit passengers. Journeys on transit that begin outside the Manhattan CBD would increase up to 2.2 percent for Tolling Scenario E. **Table 4A-16** breaks down the numbers of Manhattan CBD-related journeys for people in vehicles (drive alone and HOVs) and people in taxis and FHVs. **Table 4A-17** shows the shift in all Manhattan CBD-related transit journeys compared to the No Action Alternative by tolling scenario for 2045.

[21] Unless noted, the term "vehicles" in this subchapter refers to all on-road vehicles, including single-occupancy vehicles, HOVs, motorcycles, taxis, FHVs, buses, and trucks.

Table 4A-11. Daily Vehicles Entering the Manhattan CBD by Crossing Locations: No Action Alternative and Tolling Scenarios (2045)

CROSSING LOCATIONS	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
60th Street	**288,876**	**236,408**	**239,250**	**226,243**	**212,735**	**211,409**	**216,884**	**233,737**
FDR Drive and West Side Highway/Route 9A*	168,499	159,420	161,258	155,262	149,310	148,025	151,119	158,853
West Side Avenues	31,920	25,300	25,946	24,035	21,961	22,067	22,849	25,529
East Side Avenues	88,457	51,688	52,046	46,946	41,464	41,317	42,916	49,355
Queens	**154,348**	**138,824**	**138,730**	**142,997**	**147,894**	**147,558**	**148,430**	**136,884**
Brooklyn	**192,604**	**172,530**	**173,247**	**159,307**	**143,498**	**141,693**	**143,711**	**169,120**
New Jersey	**114,867**	**100,060**	**99,252**	**107,304**	**113,390**	**109,619**	**112,875**	**96,443**
TOTAL	**750,695**	**647,822**	**650,479**	**635,851**	**617,517**	**610,279**	**621,900**	**636,184**

* In this table, vehicle volumes reported as entering the Manhattan CBD on the FDR Drive and the West Side Highway/Route 9A are all vehicles traveling south on these facilities at 60th Street regardless of whether the vehicle eventually enters the Manhattan CBD from one of these facilities. Some vehicles reported in this table may use the West Side Highway/Route 9A and the FDR Drive to access the Hugh L. Carey Tunnel or Brooklyn Bridge without ever entering the Manhattan CBD. These volumes are reported in this manner to be consistent with how vehicle count data is published in the annual NYMTC *Hub Bound Travel Data Report*.

Table 4A-12. Percentage Change (compared to No Action Alternative) in Daily Vehicles Entering the Manhattan CBD by Crossing Locations and Tolling Scenario (2045)

CROSSING LOCATIONS	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
60th Street	**-18.2%**	**-17.2%**	**-21.7%**	**-26.4%**	**-26.8%**	**-24.9%**	**-19.1%**
FDR Drive &and West Side Highway/Route 9A*	-5.4%	-4.3%	-7.9%	-11.4%	-12.2%	-10.3%	-5.7%
West Side Avenues	-20.7%	-18.7%	-24.7%	-31.2%	-30.9%	-28.4%	-20.0%
East Side Avenues	-41.6%	-41.2%	-46.9%	-53.1%	-53.3%	-51.5%	-44.2%
Queens	**-10.1%**	**-10.1%**	**-7.4%**	**-4.2%**	**-4.4%**	**-3.8%**	**-11.3%**
Brooklyn	**-10.4%**	**-10.1%**	**-17.3%**	**-25.5%**	**-26.4%**	**-25.4%**	**-12.2%**
New Jersey	**-12.9%**	**-13.6%**	**-6.6%**	**-1.3%**	**-4.6%**	**-1.7%**	**-16.0%**
TOTAL	**-13.7%**	**-13.3%**	**-15.3%**	**-17.7%**	**-18.7%**	**-17.2%**	**-15.3%**

* In this table, vehicle volumes reported as entering the Manhattan CBD on the FDR Drive and the West Side Highway/Route 9A are all vehicles traveling south on these facilities at 60th Street regardless of whether the vehicle eventually enters the Manhattan CBD from one of these facilities. Some vehicles reported in this table may use the West Side Highway/Route 9A and the FDR Drive to access the Hugh L. Carey Tunnel or Brooklyn Bridge without ever entering the Manhattan CBD. These volumes are reported in this manner to be consistent with how vehicle count data is published in the annual NYMTC *Hub Bound Travel Data Report*.

Table 4A-13. Daily Vehicle-Miles Traveled: No Action Alternative and Tolling Scenarios (2045)

LOCATIONS	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York State	**134,186,361**	**133,549,102**	**133,603,123**	**133,407,441**	**133,011,541**	**132,941,187**	**133,056,675**	**133,576,575**
New York City	49,748,914	49,306,506	49,361,708	49,206,260	48,917,855	48,908,967	49,014,661	49,271,140
Manhattan CBD	3,402,711	3,173,972	3,199,881	3,156,249	3,117,142	3,106,570	3,147,541	3,144,017
CBD Core	1,262,019	1,211,069	1,219,101	1,222,077	1,236,236	1,230,340	1,246,015	1,197,152
Peripheral Highways (south of 60th Street; excluded from the toll)	2,140,692	1,962,903	1,980,780	1,934,172	1,880,906	1,876,230	1,901,526	1,946,865
West Side Highway/Route 9A	647,671	554,316	562,018	528,271	500,214	499,855	509,900	550,459
FDR Drive	758,659	760,056	770,395	754,497	733,879	739,383	743,921	763,263
Bridges & Tunnels	734,362	648,531	648,367	651,404	646,813	636,992	647,705	633,143
NYC Subarea 1 (see Figure 4A-2)	2,349,929	2,195,311	2,199,825	2,155,278	2,113,309	2,104,806	2,123,309	2,173,895
NYC Subarea 2 (see Figure 4A-2)	7,142,863	7,086,769	7,098,540	7,060,838	7,013,071	7,012,113	7,032,663	7,083,658
NYC Subarea 3 (see Figure 4A-2)	36,853,411	36,850,454	36,863,462	36,833,895	36,674,333	36,685,478	36,711,148	36,869,570
Long Island Counties (2)	**46,813,526**	**46,752,292**	**46,709,696**	**46,716,462**	**46,732,209**	**46,699,238**	**46,688,529**	**46,757,385**
New York Counties North of New York City (5)	**37,623,921**	**37,490,304**	**37,531,719**	**37,484,719**	**37,361,477**	**37,332,982**	**37,353,485**	**37,548,050**
New Jersey Counties (14)	**107,907,842**	**107,914,688**	**107,948,940**	**108,040,676**	**107,970,946**	**107,950,075**	**108,024,196**	**107,882,082**
Connecticut Counties (2)	**35,063,470**	**35,045,234**	**35,006,855**	**35,042,347**	**35,004,182**	**35,002,445**	**34,998,648**	**35,059,459**
TOTAL	**277,157,673**	**276,509,024**	**276,558,918**	**276,490,464**	**275,986,669**	**275,893,707**	**276,079,519**	**276,518,116**

Note: The number of counties are indicated within parentheses ( ).

Table 4A-14. Percentage Change (compared to No Action Alternative) in Daily Vehicle-Miles Traveled by Tolling Scenario (2045)

LOCATIONS	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York State	**-0.5%**	**-0.4%**	**-0.6%**	**-0.9%**	**-0.9%**	**-0.8%**	**-0.5%**
New York City	-0.9%	-0.8%	-1.1%	-1.7%	-1.7%	-1.5%	-1.0%
Manhattan CBD	-6.7%	-6.0%	-7.2%	-8.4%	-8.7%	-7.5%	-7.6%
CBD Core	-4.0%	-3.4%	-3.2%	-2.0%	-2.5%	-1.3%	-5.1%
Peripheral Highways (south of 60th Street; excluded from the toll)	-8.3%	-7.5%	-9.6%	-12.1%	-12.4%	-11.2%	-9.1%
West Side Highway/Route 9A	-14.4%	-13.2%	-18.4%	-22.8%	-22.8%	-21.3%	-15.0%
FDR Drive	0.2%	1.5%	-0.5%	-3.3%	-2.5%	-1.9%	0.6%
Bridges & Tunnels	-11.7%	-11.7%	-11.3%	-11.9%	-13.3%	-11.8%	-13.8%
NYC Subarea 1 (see Figure 4A-2)	-6.6%	-6.4%	-8.3%	-10.1%	-10.4%	-9.6%	-7.5%
NYC Subarea 2 (see Figure 4A-2)	-0.8%	-0.6%	-1.1%	-1.8%	-1.8%	-1.5%	-0.8%
NYC Subarea 3 (see Figure 4A-2)	0.0%	0.0%	-0.1%	-0.5%	-0.5%	-0.4%	0.0%
Long Island Counties (2)	**-0.1%**	**-0.2%**	**-0.2%**	**-0.2%**	**-0.2%**	**-0.3%**	**-0.1%**
New York Counties North of New York City (5)	**-0.4%**	**-0.2%**	**-0.4%**	**-0.7%**	**-0.8%**	**-0.7%**	**-0.2%**
New Jersey Counties (14)	**0.0%**	**0.0%**	**0.1%**	**0.1%**	**0.0%**	**0.1%**	**0.0%**
Connecticut Counties (2)	**-0.1%**	**-0.2%**	**-0.1%**	**-0.2%**	**-0.2%**	**-0.2%**	**0.0%**
TOTAL	**-0.2%**	**-0.2%**	**-0.2%**	**-0.4%**	**-0.5%**	**-0.4%**	**-0.2%**

Note: The number of counties are indicated within parentheses ( ).

Table 4A-15. Daily Manhattan CBD Journey Mode Share: No Action Alternative and Tolling Scenarios (2045)

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Beginning Outside the Manhattan CBD								
Auto (including HOV, Taxi, FHV)	17.7%	16.6%	16.9%	16.4%	15.7%	15.5%	15.9%	16.4%
Transit	79.7%	80.8%	80.5%	81.0%	81.7%	81.9%	81.5%	81.0%
Walk and Bike	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%	2.6%
Change in Transit Share	—	1.1%	0.8%	1.3%	2.0%	2.2%	1.8%	1.3%
Beginning Inside the Manhattan CBD								
Auto (including HOV, Taxi, FHV)	29.7%	28.3%	28.7%	28.1%	27.2%	27.1%	27.7%	27.6%
Transit	52.1%	53.0%	52.7%	53.1%	53.9%	53.8%	53.4%	54.0%
Walk and Bike	18.2%	18.7%	18.6%	18.8%	18.9%	19.1%	18.9%	18.4%
Change in Transit Share	—	0.9%	0.6%	1.0%	1.8%	1.7%	1.3%	1.9%
Within the Manhattan CBD								
Auto (including HOV, Taxi, FHV)	6.9%	7.0%	7.1%	7.0%	7.0%	7.0%	6.9%	6.9%
Transit	27.4%	27.4%	27.3%	27.4%	27.5%	27.5%	27.5%	27.8%
Walk and Bike	65.7%	65.6%	65.6%	65.6%	65.5%	65.5%	65.6%	65.2%
Change in Transit Share	—	0.0%	-0.1%	0.0%	0.1%	0.1%	0.1%	0.4%
All Manhattan CBD-Related Journeys								
Auto (including HOV, Taxi, FHV)	15.3%	14.5%	14.7%	14.3%	13.8%	13.7%	13.9%	14.3%
Transit	62.9%	63.7%	63.5%	63.8%	64.3%	64.4%	64.2%	64.0%
Walk and Bike	21.8%	21.8%	21.8%	21.9%	21.9%	21.9%	21.9%	21.8%
Change in Transit Share	—	0.8%	0.6%	0.9%	1.4%	1.5%	1.3%	1.1%

Table 4A-16. Daily Manhattan CBD-Related Auto-Based Vehicle Person-Journeys: No Action Alternative and Tolling Scenarios (2045)

MODE	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Private Vehicles (drive alone and HOVs)	413,933	397,688	397,043	388,905	380,950	371,699	374,270	393,717
	Difference	-16,245	-16,890	-25,028	-32,983	-42,234	-39,663	-20,216
	Percentage	-3.9%	-4.1%	-6.0%	-8.0%	-10.2%	-9.6%	-4.9%
Taxi/FHV	65,930	57,711	65,695	61,423	51,777	57,977	64,241	56,056
	Difference	-8,219	-235	-4,507	-14,153	-7,953	-1,689	-9,874
	Percentage	-12.5%	-0.4%	-6.8%	-21.5%	-12.1%	-2.6%	-15.0%
TOTAL	**479,863**	**455,399**	**462,738**	**450,328**	**432,727**	**429,676**	**438,511**	449,773
	Difference	**-24,464**	**-17,125**	**-29,535**	**-47,136**	**-50,187**	**-41,352**	-30,090
	Percentage	**-5.1%**	**-3.6%**	**-6.2%**	**-9.8%**	**-10.5%**	**-8.6%**	-6.3%

Note: Table includes only motorized journeys.

Table 4A-17. Daily Manhattan CBD-Related Transit Journeys: No Action Alternative and Tolling Scenarios (2045)

NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
1,990,024	2,014,453	2,011,180	2,021,324	2,033,609	2,038,364	2,033,022	2,018,632
Difference	24,429	21,156	31,300	43,585	48,340	42,998	28,608
Percentage	1.2%	1.1%	1.6%	2.2%	2.4%	2.2%	1.4%

4A.4.4 CBD Tolling Alternative Tolling Scenario Summaries

All tolling scenarios within the CBD Tolling Alternative would result in travel pattern changes that would support congestion relief: reduced automobile and truck trips to the Manhattan CBD, reduced VMT to and within the Manhattan CBD and regionally, and a shift from auto trips to transit.[22] Percentage reductions in 2023 vehicle trips entering the Manhattan CBD range from 15.4 percent (Tolling Scenario A) to 19.9 percent (Tolling Scenario E; see Table 4A-5). As summarized in Chapter 2, "Project Alternatives," the primary differences revolve around the magnitude and the distribution of the reductions resulting from the toll rates and potential crossing credits, which vary by tolling scenario. Appendix 4A.2, "Transportation: Travel Forecast Tolling Scenario Summaries and Detailed Tables," describes the opening year (2023) travel pattern changes for each tolling scenario followed by horizon year (2045) travel pattern changes for each tolling scenario compared to the No Action Alternative, and also provides details for both the 2023 and 2045 results. While the results of the 2045 model runs are different in terms of actual numbers (because they reflect the longer-term background growth in the model's forecast), the patterns from tolling scenario to tolling scenario are consistent between 2023 and 2045.

4A.4.5 Key Findings

The BPM assessment of regional travel demand and trip characteristics shows that implementing the CBD Tolling Alternative would reduce vehicular traffic within the Manhattan CBD compared to the No Action Alternative in all tolling scenarios analyzed. Based on the BPM, which looks at the time and cost associated with a trip-making decision, the imposition of a Manhattan CBD toll would reduce the number of vehicles entering the Manhattan CBD compared to the No Action Alternative for both the 2023 and the longer-term 2045 analysis years.

With the CBD Tolling Alternative, total regional VMT and vehicle-hours traveled would be reduced. The largest changes would occur in the Manhattan CBD and would diminish farther away from the Manhattan CBD. Roughly three-quarters of the auto-trip reductions into and through the Manhattan CBD would result from travelers avoiding the Manhattan CBD for through-trips (e.g., Jersey City to Brooklyn). These trips either would switch modes or, more often, would find alternative paths around the Manhattan CBD. Other auto-trip reductions would result from people switching modes for trips into the Manhattan CBD. Modeling of the CBD Tolling Alternative indicates that drivers would have three basic ways to avoid paying the Manhattan CBD toll:

- Switch to another mode such as transit.
- Choose a new and different path to avoid the Manhattan CBD for vehicular through-trips.
- Choose not to make the trip to the Manhattan CBD.

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22 Buses on the roadways are included in the calculation of volumes and VMT. However, the number of buses reflects the No Action Alternative and does not vary between the No Action Alternative and CBD Tolling Alternative. This is because the model does not include additional buses that may be needed to serve increased transit demand. Subchapter 4C, "Transportation: Transit" provides an analysis of transit demand.

AUTO TRIPS

Across all the tolling scenarios, non-taxi, Manhattan CBD-related auto-based person-journeys would decline between 4 percent and 10 percent in the 2023 analysis year, representing 16,000 to 42,000 fewer people accessing the Manhattan CBD in a private automobile[23] on an average weekday (see **Table 4A-9**). Among drivers who would continue to drive to the Manhattan CBD, some would choose different routings under tolling scenarios that introduce crossing credits.

For Tolling Scenarios A and D, taxis and FHVs would have a higher sensitivity to the Manhattan CBD toll because they would be charged each time they enter the Manhattan CBD, while private automobiles would be charged just once per day. Overall, the total decline in auto-based person-journeys to the Manhattan CBD would be between 24,000 and 46,000 person-journeys for Tolling Scenario A and Tolling Scenario D.

Subchapter 4B, "Transportation: Highways and Local Intersections," examines the potential impacts on highways and local intersections from changes in traffic volumes projected under the CBD Tolling Alternative.

TIME-OF-DAY SHIFTING

Because the traffic in the Manhattan CBD builds throughout the day, extending well into the evening, six of the seven tolling scenarios considered in this analysis (Tolling Scenarios A through E, plus Tolling Scenario G), have extended peak periods from 6:00 a.m. to 8:00 p.m. Tolling Scenario F has peak periods more consistent with those on the surrounding bridges and tunnels, from 6:00 a.m. to 10 a.m. and 4:00 p.m. to 8:00 p.m.

While arguably less important for this Project, which aims to move people from their vehicles to transit, time of day still has a role to play and is helpful to consider briefly.

In 2005, PANYNJ studied the impact of peak-period tolling on trip diversions to the off-peak period.[24] The study evaluated whether travelers shifted to the off-peak period after the PANYNJ implemented a $1 discount (20 percent lower than the peak period) for off-peak travel in 2001 on its roadway facilities entering New York City. The key findings relevant to this study indicated the following:

- Some people switched travel to the preceding hour in the AM peak.
- Trucks did not change their time-of-day choice in response to the 20 percent price difference, in part because their delivery times are dependent upon receivers and shippers.[25]

The study indicated about 10 percent of travelers were willing to shift their travel times based on time-of-day tolling, with many travelers indicating they do not have flexibility to change their travel times. The

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23 Person-journey reductions in private automobile includes drive-alone person-journeys and HOV or carpool person-journeys. Carpool person-journeys result in fewer vehicular trips than person-journeys due to higher auto occupancy.

24 Holguín-Veras, J., K. Ozbay, and A. C. de Cerreño. (2005). *Evaluation Study of Port Authority of New York and New Jersey's Time of Day Pricing Initiative*.

25 The CBD tolling scenarios would offer a deeper reduction in the overnight (50 ***to 60*** percent lower than peak-travel), which would encourage some travelers and some trucks to shift.

average amount of time travelers were willing to arrive early was 20 minutes, and the average amount of time travelers were willing or able to be late was 12 minutes.

AUTO AND TRUCK TRAVEL-TIME SAVINGS

The Project would alter the driving paths people choose to access the Manhattan CBD. Tolling Scenario A does not include any crossing credits and would result in a general reduction of auto travel to the Manhattan CBD from across the region. Due to reduced congestion, auto travel times to the Manhattan CBD would be faster in each tolling scenario from most areas of the region compared to the No Action Alternative. Some trips would experience longer auto travel times to the Manhattan CBD due to increased diversionary trips avoiding the Manhattan CBD via highways in the Bronx and Staten Island. For example, auto and truck trips from Connecticut would be slower to the Manhattan CBD due to increased diversionary traffic on the Cross Bronx Expressway and Bruckner Expressway. Longer auto and truck travel times from Central New Jersey and Staten Island would result from increased traffic on the Staten Island Expressway.

Crossing credits would make the Hugh L. Carey and Queens-Midtown Tunnels relatively more attractive to the Brooklyn, Manhattan, and Williamsburg Bridges compared to Tolling Scenario A because the net toll paid by a driver using a tolled tunnel would be closer to the cost of using one of the untolled bridges. This leveling of net tolls across the East River would increase traffic in the East River tunnels and decrease traffic on the East River bridges. As a result of this increased tunnel traffic, in tolling scenarios with crossing credits, some auto and truck travel times from Long Island to the Manhattan CBD would increase due to additional congestion in the Queens-Midtown Tunnel.

Similar diversions would also occur in Northern New Jersey and Southern Orange and Rockland Counties because traffic would move to the Lincoln and Holland Tunnels from the George Washington Bridge to take advantage of the tunnel crossing credits in Tolling Scenarios C, D, and E. However, traffic volumes at the Lincoln and Holland Tunnels still decrease in all scenarios.

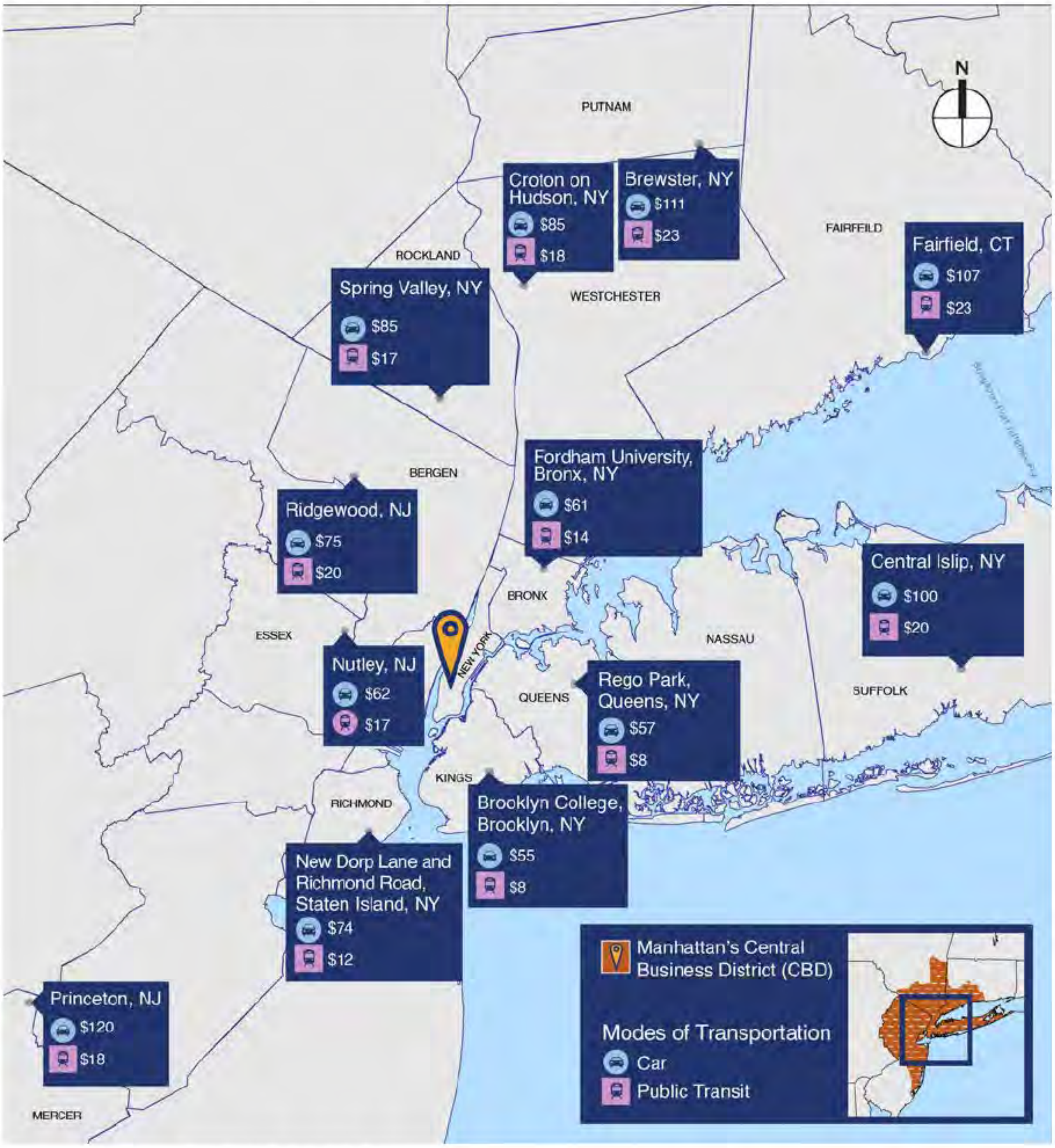
AUTO AND TRANSIT COMMUTE COSTS

The monetary cost of accessing the Manhattan CBD by auto versus transit is also important to take note of. The Manhattan CBD is the anchor of the regional economy and a destination for millions of daily trips. As discussed in many chapters of this EA, the vast majority of these trips are made via public transportation, but there are also tens of thousands of trips made by auto commuters. There are likely many reasons why a person may prefer to drive to Manhattan, but choosing to drive is an expensive undertaking for many reasons—notably extra vehicle operating costs due to congestion, existing tolls on various facilities, and limited and expensive parking.

To establish perspective, a representational typical commute from throughout the region has been evaluated to estimate the daily average cost of that trip either by auto or by transit. As shown in Figure 4A-3, this includes locations in New York City (Bronx, Queens, Brooklyn, and Staten Island), on Long Island (Central Islip), in New York communities to the north of New York City (Spring Valley, Croton-on-Hudson, Brewster), in New Jersey (Ridgewood to the north, Nutley in the central area, and Princeton to the south), and in Connecticut (Fairfield County). The average cost of each representative trip was developed using trip destinations to both a lower (World Trade Center) and upper (42nd Street, Bryant Park) Manhattan CBD location, which reflect different costs due to different routing and transit options. For these trips, when the cost of mileage, parking, and tolls are factored in, it is less expensive to take transit to the Manhattan CBD than to use a car.

For those who continue to use a car to travel to the Manhattan CBD, the overall trip cost would increase with the CBD Tolling Alternative because the CBD toll would be applied. During early public outreach, concern was raised by drivers who already pay tolls on tunnels and bridges before they enter the Manhattan CBD. To better understand the cost implications for drivers currently paying tolls to access the Manhattan CBD, Table 4A-18 provides information on the percentage increase in the cost of travel by auto that drivers could expect under the CBD Tolling Alternative for each tolling scenario for a representative trip to the World Trade Center. Table 4A-19 further provides sample toll costs for those same trips when using different crossing facilities.

[Figure 4A-3. Representative Commuting Costs in the Regional Study Area]



Source: WSP, Best Practice Model, Google Maps

Notes: See **Appendix 4A.3, "Transportation: Representative Commuting Costs by Auto and Transit"** for more detail on costs shown here.

1. Cost based on auto distance as measured by the BPM travel demand model and averaged for two destinations within the CBD (World Trade Center and 42nd Street, Bryant Park).
2. A typical driving route and transit route were obtained by reviewing recommended directions from Google Maps for an approximately 7:30 a.m. commute trip (and were compared for consistency with the BPM results).
3. Costs include the daily round-trip mileage expense using IRS Q1 2022 auto operating rate of 58.5 cents per mile, all applicable tolls, and parking.
4. For transit, the costs include the single or combination of fares and an added level of origin parking and destination travel cost.

Table 4A-18. Percentage Change in Round-Trip Driving Costs for Representative Route by Auto to the World Trade Center Using E-ZPass at 7:30 a.m.

				CBD TOLLING ALTERNATIVE - % INCREASE IN TRAVEL COST BY TOLLING SCENARIO (CBD TOLL FOR E-ZPASS PEAK AUTO)						
				SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
COUNTY	ORIGIN	CROSSING USED FOR ROUNDTRIP	NO ACTION ALTERNATIVE TRAVEL COST	Base Plan ($9)	Base Plan with Caps and Exemptions ($10)	Low Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions ($14)	High Crossing Credits for Vehicles Using Tunnels to Access the CBD ($19)	High Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions ($23)	High Crossing Credits for Vehicles Using Manhattan Bridges and Tunnels to Access the CBD, with Some Caps and Exemptions ($23)	Base Plan with Same Tolls for All Vehicle Classes ($12)
The Bronx	Fordham University	RFK	$62	14.9%	16.4%	22.6%	30.7%	37.2%	16.0%	18.7%
Brooklyn	Brooklyn College	HCT	$54	17.1%	18.9%	13.9%	11.0%	18.4%	18.4%	21.6%
Queens	Rego Park	QMT	$59	15.6%	17.2%	12.6%	10.0%	16.8%	16.8%	19.7%
Staten Island	New Dorp	HCT	*[$67]*	*[13.7%]*	*[15.1%]*	*[11.1%]*	*[8.8%]*	*[14.7%]*	*[14.7%]*	*[17.3%]*
Suffolk	Central Islip	QMT	$102	9.0%	9.9%	7.3%	5.8%	9.7%	9.7%	11.4%
Rockland	Spring Valley	GWB	$86	10.7%	11.8%	16.3%	22.1%	26.8%	11.5%	13.5%
Westchester	Croton-on-Hudson	HHB	$86	10.6%	11.7%	16.2%	22.0%	26.6%	19.7%	13.4%
Putnam	Brewster	RFK	$116	7.9%	8.8%	12.1%	16.4%	19.9%	8.6%	10.0%
Bergen	Ridgewood	HT	$76	12.1%	13.3%	9.8%	7.8%	13.0%	13.0%	15.2%
Essex	Nutley	HT	$64	14.4%	15.8%	11.6%	9.2%	15.4%	15.4%	18.1%
Mercer	Princeton	HT	$116	7.9%	8.7%	6.4%	5.1%	8.5%	8.5%	10.0%
Fairfield	Fairfield	RFK	$113	8.1%	9.0%	12.4%	16.8%	20.3%	8.8%	10.3%

Source: WSP, BPM, Google Maps

Notes: See **Appendix 4A.3, "Transportation: Representative Commuting Costs by Auto and Transit"** for more detail on the No Action Alternative costs in this table.

1. Auto costs based on the auto route distance as measured by the BPM travel demand model.
2. A typical driving route was obtained by reviewing recommended directions from Google Maps for an approximately 7:30 a.m. commute trip (and were compared for consistency with the BPM results).
3. Costs include the daily round-trip mileage expense using IRS Q1 2022 auto operating rate of 58.5cents per mile, all applicable tolls and parking.
4. GWB–George Washington Bridge; HCT–Hugh L. Carey Tunnel; HHB–Henry Hudson Bridge; HT–Holland Tunnel; QMT–Queens Midtown Tunnel; RFK–Robert F. Kennedy Bridge.

[5. Driving cost from Staten Island assumes Verrazzano-Narrows Bridge tolls are $2.75 each way, which is consistent with the effective toll rate in MTA's Staten Island Resident Rebate Program.]

Table 4A-19. Total Tolls, Round-Trip, for Representative Routes by Auto to the World Trade Center Using E-ZPass at 7:30 a.m.

COUNTY	ORIGIN	CROSSING USED FOR ROUNDTRIP[1]	NO ACTION ALTERNATIVE TOLL COST, ROUND-TRIP[2]	CBD TOLLING ALTERNATIVE – TOTAL TOLLS BY TOLLING SCENARIO(CBD TOLL FOR E-ZPASS PEAK AUTO)						
				SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
				Base Plan ($9)	Base Plan with Caps and Exemptions ($10)	Low Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions ($14)	High Crossing Credits for Vehicles Using Tunnels to Access the CBD ($19)	High Crossing Credits for Vehicles Using Tunnels to Access the CBD, with Some Caps and Exemptions ($23)	High Crossing Credits for Vehicles Using Manhattan Bridges and Tunnels to Access the CBD, with Some Caps and Exemptions ($23)	Base Plan with Same Tolls for All Vehicle Classes ($12)
The Bronx	Fordham University	Robert F Kennedy Bridge	$13.10	$22.10	$23.10	$27.10	$32.10	$36.10	$23.00	$25.10
		Willis Ave Bridge	$0	$9.00	$10.00	$14.00	$19.00	$23.00	$23.00	$12.00
Brooklyn	Brooklyn College	Hugh L. Carey Tunnel	$13.10	$22.10	$23.10	$20.55	$19.00	$23.00	$23.00	$25.10
		Brooklyn Bridge	$0	$9.00	$10.00	$14.00	$19.00	$23.00	$23.00	$12.00
Queens	Rego Park	Queens Midtown Tunnel	$13.10	$22.10	$23.10	$20.55	$19.00	$23.00	$23.00	$25.10
		Brooklyn Bridge	$0	$9.00	$10.00	$14.00	$19.00	$23.00	$23.00	$12.00
Staten Island	New Dorp[3]	VNB + Hugh L. Carey Tunnel	***[$18.60]***	***[$27.60]***	***[$28.60]***	***[$26.05]***	***[$24.50]***	***[$28.50]***	***[$28.50]***	***[$30.60]***
		VNB + Brooklyn Bridge	***[$5.50]***	***[$14.50]***	***[$15.50]***	***[$19.50]***	***[$24.50]***	***[$28.50]***	***[$28.50]***	***[$17.50]***
Suffolk	Central Islip	Queens Midtown Tunnel	$13.10	$22.10	$23.10	$20.55	$19.00	$23.00	$23.00	$25.10
		Brooklyn Bridge	$0	$9.00	$10.00	$14.00	$19.00	$23.00	$23.00	$12.00
Rockland	Spring Valley	George Washington Bridge	$13.75	$22.75	$23.75	$27.75	$32.75	$36.75	$23.65	$25.75
		MCB[4] + Willis Ave Bridge	$3.45	$12.45	$13.45	$17.45	$22.45	$26.45	$26.45	$15.45
Westchester	Croton-on-Hudson	Henry Hudson Bridge	$6.00	$15.00	$16.00	$20.00	$25.00	$29.00	$23.00	$18.00
		Willis Ave Bridge	$0	$9.00	$10.00	$14.00	$19.00	$23.00	$23.00	$12.00
Putnam	Brewster	Robert F Kennedy Bridge	$13.10	$22.10	$23.10	$27.10	$32.10	$36.10	$23.00	$25.10
		Willis Ave Bridge	$0	$9.00	$10.00	$14.00	$19.00	$23.00	$23.00	$12.00
Bergen	Ridgewood	George Washington Bridge	$13.75	$22.75	$23.75	$27.75	$32.75	$36.75	$23.65	$25.75
		Lincoln or Holland Tunnel	$13.75	$22.75	$23.75	$21.20	$19.65	$23.65	$23.65	$25.75
Essex	Nutley	Lincoln or Holland Tunnel	$13.75	$22.75	$23.75	$21.20	$19.65	$23.65	$23.65	$25.75
Mercer	Princeton	OBX + VNB + HCT[5]	$39.95	$48.95	$49.95	$47.40	$45.85	$49.85	$49.85	$51.95
		NJ Turnpike + Holland Tunnel	$23.08	$32.08	$33.08	$30.53	$28.98	$32.98	$32.98	$35.08
Fairfield	Fairfield	Robert F Kennedy Bridge	$13.10	$22.10	$23.10	$27.10	$32.10	$36.10	$23.00	$25.10
		Willis Ave Bridge	$0	$9.00	$10.00	$14.00	$19.00	$23.00	$23.00	$12.00

Sources: TBTA, PANYNJ, NYSTA, Google Maps
1 A typical driving route was obtained by reviewing recommended directions from Google Maps for both toll and non-toll choices, where available.
2 Toll rates as of July 2022.
3 ***[Driving cost from Staten Island assumes Verrazzano-Narrows Bridge tolls are $2.75 each way, which is consistent with the effective toll rate in MTA's Staten Island Resident Rebate Program.]***
[4] MCB–Mario Cuomo Bridge. At the Mario Cuomo Bridge, the commuter E-ZPass cost of $3.45 is used here. The resident cost is $4.75; standard E-ZPass is $5.75; and out of state E-ZPass pays $6.61.
[5] OBX-Outerbridge Crossing; VNB–Verrazzano Narrows Bridge; HCT–Hugh L. Carey Tunnel.

BROOKLYN BRIDGE AND HUGH L. CAREY TUNNEL

The Brooklyn Bridge and Hugh L. Carey Tunnel would provide access across the East River to and from the FDR Drive and the West Side Highway/Route 9A that would not be subject to the Manhattan CBD toll. The Battery Park Underpass is not tolled and would not be tolled in the future, and therefore offers an untolled connection between the FDR Drive and the West Side Highway/Route 9A around the southern edge of Manhattan.

These Manhattan CBD toll exemptions for the Hugh L. Carey Tunnel ramps to the West Side Highway/Route 9A and Brooklyn Bridge ramps to the FDR Drive would provide a toll-free route around the Manhattan CBD to and from Brooklyn. Traffic from the Hugh L. Carey Tunnel and Brooklyn Bridge directly accessing Manhattan CBD streets would pay the Manhattan CBD toll. For all tolling scenarios, the total number of vehicles using the Brooklyn Bridge toward Manhattan would decrease, but volumes on the ramp connecting Manhattan-bound bridge traffic to the FDR Drive would increase (**Table 4A-20**). Tolling scenarios that provide crossing credits on TBTA facilities into the Manhattan CBD would subdue these increases, because crossing credits would increase the relative attractiveness of using TBTA tunnels.

Table 4A-20. Brooklyn Bridge Average Weekday Vehicle Volumes (Manhattan-Bound): No Action Alternative and Tolling Scenarios

DIRECTION	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Manhattan-Bound								
Main Span	58,976	55,180	54,883	50,181	45,361	44,995	44,691	55,096
Ramp to FDR Drive	39,415	44,690	44,718	44,293	42,337	42,155	41,830	45,270
Ramps to Manhattan CBD	19,164	10,091	9,767	5,491	2,626	2,442	2,463	9,428
Manhattan-Bound (Difference from No Action Alternative)								
Main Span	—	-3,796	-4,093	-8,795	-13,615	-13,981	-14,285	-3,880
Ramp to FDR Drive	—	5,275	5,303	4,878	2,922	2,740	2,415	5,855
Ramps to Manhattan CBD	—	-9,073	-9,397	-13,673	-16,538	-16,722	-16,701	-9,736

Note: Volumes in this table are results directly from the BPM. **Subchapter 4B, "Transportation: Highways and Local Intersections,"** includes more detailed traffic engineering analysis with additional bridge capacity and operational restrictions, which are beyond the scope of regional analysis considered by the BPM.

Manhattan-bound volumes in the Hugh L. Carey Tunnel would increase for all tolling scenarios. For Tolling Scenario A and Tolling Scenario B, volume increases would result from increased demand to West Street and the FDR Drive via the Battery Park Underpass (**Table 4A-21**). This connection would not be subject to the Manhattan CBD toll in any of the tolling scenarios. For Tolling Scenarios C, D, E and F, use of the tunnel would also increase in response to the crossing credits for the TBTA tunnel toll. In these tolling scenarios, the increase in traffic would be derived from travelers diverted by the advantage of Manhattan CBD crossing credits offered by using the Hugh L. Carey Tunnel to access the Manhattan CBD.

Table 4A-21. Hugh L. Carey Tunnel Average Weekday Vehicle Volumes (Manhattan-Bound): No Action Alternative and Tolling Scenarios

DIRECTION	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Manhattan-Bound								
Volume	31,063	31,785	32,061	41,122	51,087	51,369	50,962	31,580
Manhattan-Bound (Difference from No Action Alternative)								
Volume	—	722	998	10,059	20,025	20,306	19,900	517

Note: Volumes in this table are results directly from the BPM. **Subchapter 4B, "Transportation: Highways and Local Intersections,"** includes more detailed traffic engineering analysis with additional tunnel capacity and operational restrictions, which are beyond the scope of regional analysis considered by the BPM.

TRUCK TRIPS

BPM analysis of truck trips assumed that deliveries would still be made to restaurants, businesses, and residents regardless of Project implementation. The BPM assumed that trip origins and destinations of trucks and other commercial vehicles would remain consistent across all the tolling scenarios. As a result, all modeled reductions in trucks into the Manhattan CBD would result from through-trips diverting around the Manhattan CBD, balancing increased cost to access the Manhattan CBD and increased travel times to avoid the Manhattan CBD. The BPM analysis also assumed that trucks would use only valid truck routes.

The model estimates a reduction in trucks through the Manhattan CBD ranging from approximately 1,700 trucks in Tolling Scenario G to nearly 6,800 trucks in Tolling Scenario F compared to the No Action Alternative (**Table 4A-22**). Tolling Scenario F would have the highest tolls for trucks entering the Manhattan CBD.

Table 4A-22. Average Daily Truck Trips through the Manhattan CBD: No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Truck Trips Through Manhattan CBD	8,392	3,746	3,424	3,139	2,705	1,788	1,607	6,657
Difference	—	-4,645	-4,967	-5,253	-5,687	-6,604	-6,784	-1,734

In addition to the BPM analysis, an assessment of truck travel changes from the congestion pricing programs in London and Stockholm were reviewed, along with findings from academic research on the propensity of shippers to switch toward overnight (or lower-toll period) deliveries once the Project is under way. Most importantly, the London and Stockholm post-implementation studies suggest that truck delivery companies continue to deliver their goods regardless of a congestion pricing program. Commercial stores still need their goods delivered. In some instances when reduced congestion in the core could improve travel times, some truck companies switched their deliveries into the peak period to deliver their goods.

For example, the congestion pricing program trial in Stockholm resulted in more truck deliveries in the middle of the day between commuting peak hours. Stockholm truck distribution companies were surveyed,

and feedback showed that companies felt positively about the program regarding reduced congestion and more efficient deliveries.[26]

Transport for London reported that approximately 10 percent of business sectors changed their policies on the timing of deliveries in response to the congestion pricing program. Like Stockholm, these temporal changes have resulted in truck companies either taking advantage of reduced congestion or avoiding congestion charges altogether.[27]

A report published in 2011[28] concludes that *[many]* truck delivery carriers are limited in their ability to change delivery times because receivers need to agree to overnight deliveries. Receivers *[may prefer regular-hour deliveries because they typically have more staff on hand, as opposed to off-hour deliveries that could require additional staff, security, lighting, and other costs]*. Chapter 6, "Economic Conditions," *[Section 6.3.3.2,]* provides an analysis of the economic effects of the CBD Tolling Alternative on truck delivery companies and the receivers of their deliveries.

[For the Final EA, the Project Sponsors have added two new mitigation commitments to incentivize off-peak truck deliveries and reduce the number of trucks that divert around the Manhattan CBD: 1) a commitment to further reduce overnight toll rates; and 2) a commitment to expand NYCDOT's Off-Hours Delivery Program, a pilot program that provides support for businesses that shift their deliveries to off-peak periods.]

VEHICLE-MILES TRAVELED

Under all tolling scenarios, daily VMT would decline across the 28-county region, with the greatest declines occurring within the Manhattan CBD (see Table 4A-7). For the tolling scenarios analyzed, higher toll rates lead to more daily VMT reductions. Tolling scenarios with crossing credits temper daily VMT reductions in the Manhattan CBD, while leading to greater reductions outside of the Manhattan CBD. Within the Manhattan CBD Core, daily VMT would decline from 1.22 million in the No Action Alternative to between 1.14 million and 1.18 million (a decrease of between 2.8 percent and 6.2 percent). For the entire Manhattan CBD, daily VMT would decline from 3.24million in the No Action Alternative to between 2.95 million and 3.02 million (a decrease of between 9.2 percent and 7.1 percent). In 2023 for all tolling scenarios, the regional daily VMT would decline from 254.7 million to between 253.6 million and 254.2 million daily VMT (a decrease of between 0.4 percent and 0.2 percent).

Due to traffic diverting around Manhattan to avoid the Manhattan CBD toll, VMT would increase on Staten Island for all tolling scenarios and in the Bronx for Tolling Scenarios A, B, C, F, and G. Table 4A-25 and Table 4A-27 present the quantity of these changes. Through the early outreach for the Project, the Project Sponsors heard from environmental justice communities that they would like a better understanding of the composition of vehicles that would be responsible for these VMT increases. Thus, Table 4A-26 and

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26 Congestion Charge Secretariat, City of Stockholm. Facts and results from the Stockholm Trials. December 2006. http://www.planetizen.com/files/Final%20Report_The%20Stockholm%20Trial.pdf.

27 Transport for London. Impacts monitoring: Second Annual Report. April 2004. http://content.tfl.gov.uk/impacts-monitoring-report-2.pdf.

28 Holguín-Veras, José. (2011). Urban delivery industry response to cordon pricing, time-distance pricing, and carrier-receiver policies in competitive markets. Transportation Research Part A: Policy and Practice. Volume 45, Issue 8, 2011, pp. 802-824, ISSN 0965-8564, https://doi.org/10.1016/j.tra.2011.06.008.

Table 4A-28 provide the vehicle types related to these changes for Staten Island and the Bronx, respectively.

Some increases in VMT would occur within or near environmental justice communities. Chapter 17, "Environmental Justice," discusses a broader description of these increases. However, VMT changes were tabulated for environmental justice and non-environmental justice communities and are presented in Table 4A-23 and Table 4A-24 for the various subareas of the region. A comparison of the two tables reveals the following:

- Within New York City, non-environmental justice areas would have slightly higher reductions in VMT in all but tolling scenario F compared to environmental justice areas.
- Within the Manhattan CBD core, environmental justice areas would have higher reductions in VMT for all tolling scenarios compared to non-environmental justice areas.
- Within NYC Subarea 1, environmental justice areas would have slightly lower reductions in VMT compared to non-environmental justice areas for Tolling Scenarios A, B, and G (tolling scenarios without crossing credits) and slightly higher reductions in VMT compared to non-environmental justice areas for Tolling Scenarios C, D, E, and F (tolling scenarios with crossing credits).
- Within NYC Subarea 2, environmental justice areas would experience similar but slightly lower reductions in VMT compared to non-environmental justice areas, in all but Tolling Scenario F.
- Within NYC Subarea 3, environmental justice areas would experience slight reductions in VMT in Tolling Scenarios C, D, E, and F, while non-environmental justice areas would experience increases in VMT.
- For all New York counties, environmental justice areas would experience slightly higher reductions in VMT compared to non-environmental justice areas for Tolling Scenarios C, D, E, and F.

For all Long Island counties, environmental justice areas would experience similar or slightly higher reductions in VMT compared to non-environmental justice areas for all tolling scenarios. For all New Jersey and Connecticut counties, environmental justice areas would experience similar changes in VMT compared to non-environmental justice areas for all tolling scenarios.

MODE SHIFT TO TRANSIT

Some of the decline in auto access to the Manhattan CBD would translate to increases in transit trips. Transit trips (e.g., commuter rail, subway, bus, tram, and ferry) to the Manhattan CBD from outside the Manhattan CBD would increase between 1 percent and 2 percent, depending on the tolling scenario (see Table 4A-8). These transit trips represent an AM peak period (6:00 a.m. to 10:00 a.m.) increase of between 22,000 and 45,000 people each weekday. See Subchapter 4C, "Transportation: Transit," for a more complete description of the changes in transit use.

Table 4A-23. Vehicle-Miles Traveled Percentage Changes by Tolling Scenario in Environmental Justice Census Tracts by Subarea (2023)

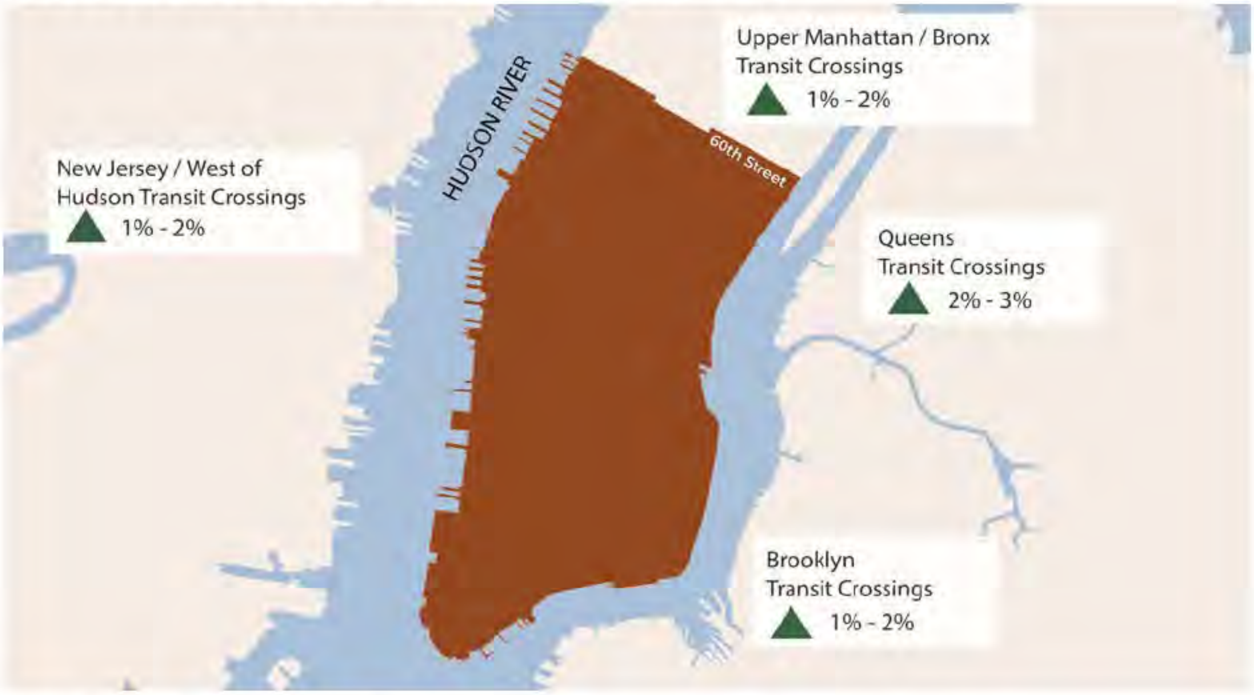
LOCATIONS	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York State	**54,496,693**	**-0.3%**	**-0.3%**	**-0.7%**	**-1.0%**	**-1.1%**	**-0.8%**	**-0.4%**
New York City	30,852,557	-0.5%	-0.4%	-1.0%	-1.4%	-1.5%	-1.2%	-0.5%
Manhattan CBD	1,048,542	-8.0%	-7.8%	-11.1%	-15.6%	-16.2%	-14.4%	-8.7%
CBD Core	338,339	-10.3%	-10.1%	-12.3%	-15.5%	-16.7%	-14.3%	-11.4%
Peripheral Highways (south of 60th Street; excluded from the toll)	710,203	-6.9%	-6.7%	-10.6%	-15.6%	-15.9%	-14.4%	-7.4%
West Side Highway/Route 9A	181,790	-12.8%	-12.4%	-15.0%	-18.3%	-19.0%	-16.2%	-13.6%
FDR Drive	338,626	1.6%	2.2%	0.8%	-0.8%	-0.1%	1.1%	2.0%
Bridges & Tunnels	189,787	-16.6%	-17.2%	-26.5%	-39.5%	-41.3%	-40.4%	-18.4%
NYC Subarea 1 (see Figure 4A-2)	871,420	-7.3%	-7.6%	-10.7%	-14.5%	-14.9%	-14.4%	-8.3%
NYC Subarea 2 (see Figure 4A-2)	3,992,349	-0.1%	0.0%	-0.7%	-1.5%	-1.6%	-1.2%	-0.2%
NYC Subarea 3 (see Figure 4A-2)	24,940,246	0.0%	0.1%	-0.3%	-0.3%	-0.4%	-0.2%	0.0%
Long Island Counties (2)	14,052,534	-0.1%	0.0%	-0.2%	-0.3%	-0.3%	-0.1%	-0.1%
New York Counties North of New York City (5)	9,591,602	-0.1%	-0.2%	-0.4%	-0.7%	-0.8%	-0.6%	-0.2%
New Jersey Counties (14)	**42,703,264**	**0.0%**	**0.0%**	**0.2%**	**0.2%**	**0.1%**	**0.2%**	**0.0%**
Connecticut Counties (2)	**8,274,823**	**-0.1%**	**-0.1%**	**-0.2%**	**-0.2%**	**-0.1%**	**0.0%**	**-0.2%**
TOTAL	**105,474,780**	**-0.2%**	**-0.2%**	**-0.3%**	**-0.5%**	**-0.5%**	**-0.3%**	**-0.2%**

Table 4A-24. Vehicle-Miles Traveled Percentage Changes by Tolling Scenario in Non-Environmental Justice Census Tracts by Subarea (2023)

LOCATIONS	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York State	**67,689,790**	**-0.4%**	**-0.4%**	**-0.6%**	**-0.6%**	**-0.7%**	**-0.4%**	**-0.5%**
New York City	16,279,182	-1.5%	-1.3%	-1.6%	-1.5%	-1.6%	-1.0%	-1.6%
Manhattan CBD	2,196,245	-7.6%	-7.5%	-6.6%	-5.4%	-5.9%	-3.6%	-8.3%
CBD Core	879,387	-3.6%	-3.5%	-1.7%	-0.7%	-1.5%	1.6%	-4.2%
Peripheral Highways (south of 60th Street; excluded from the toll)	1,316,858	-10.3%	-10.1%	-9.8%	-8.5%	-8.7%	-7.0%	-11.0%
West Side Highway/Route 9A	428,866	-17.8%	-17.3%	-21.0%	-21.5%	-20.9%	-18.6%	-17.9%
FDR Drive	382,055	-0.2%	0.4%	-1.2%	-3.2%	-2.6%	-0.8%	-0.1%
Bridges & Tunnels	505,937	-11.5%	-12.0%	-6.9%	-1.5%	-3.1%	-1.9%	-13.4%
NYC Subarea 1 (see Figure 4A-2)	1,346,653	-7.8%	-7.6%	-9.0%	-10.1%	-10.7%	-9.7%	-8.5%
NYC Subarea 2 (see Figure 4A-2)	2,668,602	-1.2%	-1.1%	-1.7%	-0.9%	-1.1%	-0.6%	-1.4%
NYC Subarea 3 (see Figure 4A-2)	10,067,682	0.7%	0.8%	0.6%	0.4%	0.4%	0.5%	0.8%
Long Island Counties (2)	27,533,010	0.1%	0.0%	0.0%	-0.2%	-0.2%	0.1%	0.0%
New York Counties North of New York City (5)	23,877,598	-0.2%	-0.2%	-0.5%	-0.6%	-0.8%	-0.5%	-0.3%
New Jersey Counties (14)	**54,874,836**	**0.0%**	**0.0%**	**0.2%**	**0.2%**	**0.1%**	**0.2%**	**0.1%**
Connecticut Counties (2)	**26,635,047**	**-0.1%**	**-0.2%**	**-0.2%**	**-0.2%**	**-0.2%**	**-0.1%**	**-0.2%**
TOTAL	**149,199,673**	**-0.2%**	**-0.2%**	**-0.2%**	**-0.3%**	**-0.3%**	**-0.1%**	**-0.2%**

While **Table 4A-8** shows a more aggregate change in transit activity, **Figure 4A-4** shows a more detailed picture of the changes in transit trips (crossings) into the Manhattan CBD from different locations outside of the Manhattan CBD. All tolling scenarios would lead to an increase in transit trips from each location shown in the map.

Figure 4A-4. Change in Transit Crossings into the Manhattan CBD



Source: BPM, range of results across all tolling scenarios

DIVERSIONS TO OTHER ROUTES

With the CBD Tolling Alternative, some people who previously traveled through the Manhattan CBD in vehicle or truck would choose a different path to avoid the Manhattan CBD altogether. For example, a person traveling by car from Caldwell, New Jersey, to Lincoln Center in Manhattan typically uses the Lincoln Tunnel between New Jersey and New York. Under some of the tolling scenarios, that same person would likely choose to reroute across the George Washington Bridge to avoid the Manhattan CBD toll. Between 72 percent and 82 percent of the total traffic reductions in the Manhattan CBD would be from through-trips finding other paths that do not include the Manhattan CBD.

In addition, some drivers who would continue to drive to the Manhattan CBD would choose a different route based on the introduction of Manhattan CBD crossing credits. In tolling scenarios with crossing credits, some drivers would choose more direct paths using free or reduced crossing credits when the cost of the toll is crossing-credited against their CBD toll, thereby minimizing the cost differential of traffic on East River crossings. **Subchapter 4B, "Transportation: Highways and Local Intersections,"** examines these specific highway- and intersection-based consequences and potential impacts of the CBD Tolling Alternative.

DIVERSION EFFECTS ON STATEN ISLAND

As a result of diversions, average daily traffic and congestion would increase in certain corridors outside of the Manhattan CBD. VMT, average daily traffic, and congestion in Staten Island would increase as a result of the CBD Tolling Alternative. This increase would be limited mostly to highways, with a minimum of change on local streets. In Staten Island, 92 percent of the total increase in VMT in Tolling Scenario A would be on highways (Table 4A-25). For tolling scenarios with crossing credits, the share of additional VMT on the highways in Staten Island would decline to 84 percent of the total increase.

On Staten Island highways, more than 90 percent of the increase in VMT would be caused by increased personal vehicle traffic, with the remaining percentage from commercial trucks in all tolling scenarios (Table 4A-26).

DIVERSION EFFECTS IN THE BRONX

As a result of diversions, average daily traffic and congestion would increase in certain corridors outside of the Manhattan CBD. In the Bronx, VMT would increase across Tolling Scenarios A, B, C, F, and G, with all the increase in VMT in the tolling scenarios occurring on highways (in each direction of travel) and ramps while local streets would have less VMT (Table 4A-27). In Tolling Scenarios A, B, C, F, and G, VMT in the Bronx would increase for personal vehicles, while VMT for commercial trucks would increase in all tolling scenarios except G (Table 4A-28).

During the public outreach phase of the Project, several commenters raised questions about the type and location of diversions in the Bronx, and particularly on the Cross Bronx Expressway, the Bruckner Expressway, and the Major Deegan Expressway. Additional analysis was conducted to address these questions, and it is presented here.

Increases in VMT in the Bronx would be driven largely by increases in VMT on the Cross Bronx Expressway between the Alexander Hamilton Bridge and the two Long Island Sound crossings (Whitestone and Throgs Neck Bridges). Personal vehicle VMT would comprise most of the VMT increases on the Cross Bronx Expressway, with commercial truck VMT contributing roughly 25 percent of the overall VMT increase in all tolling scenarios (Table 4A-29).

On Bronx highways other than the Cross Bronx Expressway, VMT would increase in Tolling Scenarios A, B, F, and G. All tolling scenarios with crossing credits would have lower VMT changes than Tolling Scenarios A and B, and Tolling Scenarios C, D, and E would have a decrease in VMT on other Bronx highways. (Table 4A-31).

Table 4A-25. Staten Island Daily Vehicle-Miles Traveled by Roadway Type (2023): No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Staten Island Vehicle-Miles Traveled								
All Roads	3,986,457	4,071,056	4,078,180	4,078,984	4,076,004	4,085,745	4,080,603	4,098,571
Highways	1,954,370	2,032,359	2,037,322	2,038,405	2,031,673	2,040,204	2,033,669	2,052,174
Local Streets	1,848,897	1,851,808	1,853,295	1,853,460	1,856,424	1,857,188	1,859,385	1,858,658
Ramps	183,191	186,890	187,563	187,119	187,907	188,354	187,549	187,739
Staten Island Vehicle-Miles Traveled (Difference from No Action Alternative)								
All Roads	—	84,598	91,723	92,526	89,547	99,288	94,145	112,113
Highways	—	77,988	82,952	84,035	77,303	85,834	79,299	97,804
Local Streets	—	2,911	4,398	4,563	7,527	8,291	10,488	9,762
Ramps	—	3,699	4,372	3,928	4,716	5,163	4,358	4,548

Table 4A-26. Staten Island Daily Vehicle-Miles Traveled on Highways by Vehicle Type (2023): No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Staten Island Highway Vehicle-Miles Traveled								
Personal Vehicle	1,784,013	1,863,248	1,866,725	1,867,229	1,859,509	1,867,296	1,862,611	1,885,233
Taxi/FHV/ Commercial Van	54,327	49,048	49,105	49,358	50,283	48,622	49,341	49,767
Commercial Truck	110,041	114,074	115,505	115,830	115,893	118,298	115,729	111,186
Bus	5,988	5,988	5,988	5,988	5,988	5,988	5,988	5,988
Staten Island Highway Vehicle-Miles Traveled (Difference from No Action Alternative)								
Personal Vehicle	—	79,235	82,711	83,216	75,496	83,283	78,598	101,220
Taxi/FHV/ Commercial Van	—	-5,279	-5,223	-4,969	-4,044	-5,705	-4,986	-4,560
Commercial Truck	—	4,033	5,464	5,789	5,852	8,257	5,687	1,144
Bus*	—	*	*	*	*	*	*	*

* In the BPM, all buses (e.g., MTA NYCT, MTA Bus Company, NJ TRANSIT and private operators) were considered insensitive to Manhattan CBD tolling, because such buses were assigned a fixed route and headway based on existing or planned service. Transit vehicles in the model were not allowed to deviate from those routes or headways based on tolls or congestion. Therefore, bus volumes are the same across tolling scenarios.

Table 4A-27. Bronx Daily Vehicle-Miles Traveled by Roadway Type (2023): No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Bronx Vehicle-Miles Traveled								
All Roads	7,489,634	7,512,109	7,508,943	7,491,356	7,479,948	7,465,870	7,495,104	7,497,337
Highways	4,941,832	4,965,292	4,965,119	4,950,635	4,941,795	4,934,194	4,953,800	4,956,677
Local Streets	2,017,196	2,012,399	2,010,155	2,008,325	2,006,281	2,001,172	2,007,692	2,006,147
Ramps	530,606	534,418	533,668	532,397	531,872	530,504	533,613	534,513
Bronx Vehicle-Miles Traveled (Difference from No Action Alternative)								
All Roads	—	22,475	19,308	1,722	-9,686	-23,764	5,470	7,703
Highways	—	23,460	23,287	8,803	-38	-7,638	11,967	14,844
Local Streets	—	-4,797	-7,041	-8,872	-10,915	-16,024	-9,504	-11,049
Ramps	—	3,812	3,063	1,791	1,266	-102	3,007	3,907

Table 4A-28. Bronx Daily Vehicle-Miles Traveled on Highways by Vehicle Type (2023): No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Bronx Highway Vehicle-Miles Traveled								
Personal Vehicle	4,275,956	4,298,318	4,294,704	4,282,357	4,275,223	4,264,603	4,282,572	4,296,317
Taxi/FHV/ Commercial Van	249,631	242,846	245,607	245,673	243,385	247,686	249,576	244,131
Commercial Truck	405,597	413,481	414,161	411,957	412,540	411,258	411,005	405,582
Bus	10,647	10,647	10,647	10,647	10,647	10,647	10,647	10,647
Bronx Highway Vehicle-Miles Traveled (Difference from No Action Alternative)								
Personal Vehicle	—	22,362	18,748	6,401	-734	-11,354	6,616	20,360
Taxi/FHV/ Commercial Van	—	-6,786	-4,024	-3,958	-6,246	-1,945	-56	-5,500
Commercial Truck	—	7,884	8,564	6,360	6,942	5,660	5,407	-16
Bus*	—	*	*	*	*	*	*	*

* In the BPM, all buses (e.g., MTA NYCT, MTA Bus Company, NJ TRANSIT and private operators) were considered insensitive to Manhattan CBD tolling, because such buses were assigned a fixed route and headway based on existing or planned service. Transit vehicles in the model were not allowed to deviate from those routes or headways based on tolls or congestion. Therefore, bus volumes are the same across tolling scenarios.

Table 4A-29. Cross-Bronx Daily Vehicle-Miles Traveled by Vehicle Type (2023): No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Bronx Highway Vehicle-Miles Traveled								
Personal Vehicle	562,113	573,862	571,858	570,545	567,198	569,538	567,172	574,355
Taxi/FHV/ Commercial Van	35,574	35,752	36,516	36,513	36,928	37,472	37,117	36,352
Commercial Truck	100,673	102,559	102,661	101,775	102,333	101,447	102,642	100,226
Bus	58	58	58	58	58	58	58	58
TOTAL	**698,418**	**712,232**	**711,093**	**708,892**	**706,518**	**708,515**	**706,989**	**710,991**
Bronx Highway Vehicle-Miles Traveled (Difference from No Action Alternative)								
Personal Vehicle	—	11,749	9,746	8,433	5,086	7,426	5,059	12,242
Taxi/FHV/ Commercial Van	—	179	942	939	1,354	1,898	1,543	778
Commercial Truck	—	1,886	1,988	1,102	1,660	774	1,969	-447
Bus*	—	*	*	*	*	*	*	*
TOTAL	—	**13,814**	**12,675**	**10,474**	**8,100**	**10,097**	**8,571**	**12,573**

* In the BPM, all buses (e.g., MTA NYCT, MTA Bus Company, NJ TRANSIT and private operators) were considered insensitive to Manhattan CBD tolling, because such buses were assigned a fixed route and headway based on existing or planned service. Transit vehicles in the model were not allowed to deviate from those routes or headways based on tolls or congestion. Therefore, bus volumes are the same across tolling scenarios.

Finally, several comments were made regarding traffic and VMT increases on the three primary highways in the South Bronx—the Cross Bronx Expressway, Major Deegan Expressway, and Bruckner Expressway. The increases on the Cross Bronx Expressway are covered earlier in this section. The Major Deegan Expressway and Bruckner Expressway would both have lower VMT in all the tolling scenarios compared to the No Action Alternative. With the number of vehicles entering the Manhattan CBD decreasing, fewer drivers would use these two highways to access the CBD thus reducing VMT on these two highways (**Table 4A-32**).This is consistent as well with an overall decline in driving on local streets within the Bronx (**Table 4A-27**).

During early public outreach, concern was raised regarding the incremental increase in truck traffic, specifically, over the Cross Bronx Expressway. Additional analysis was done to provide more insight into the number of trucks that would divert. As a result of that analysis, Tolling Scenario G was added to this EA to demonstrate how that number could be reduced through the toll structure. **Table 4A-30** shows the volume of trucks on the Cross Bronx Expressway at Macombs Road, a location with a particularly high increase in daily truck volume. Analysis of the reason behind the truck volume increases revealed that long-distance trucks that previously passed through the Manhattan CBD would switch to the Cross Bronx Expressway in large numbers in Tolling Scenarios A through F. The significant reduction in additional trucks in Tolling Scenario G would result from reducing the truck toll to match the passenger vehicle toll.

Table 4A-30. Cross-Bronx Daily Truck Volume Changes (2023): No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Cross Bronx Expressway Daily Truck Volume at Macombs Road								
Commercial Trucks	27,592	28,100	28,296	27,762	28,102	27,970	28,128	27,642
Cross Bronx Expressway Daily Truck Volume at Macombs Road (Difference from No Action Alternative)								
Commercial Trucks	—	509	704	170	510	378	536	50

Source: WSP, BPM

Table 4A-31. Bronx Highways excluding Cross Bronx Expressway Daily Vehicle-Miles Traveled by Vehicle Type (2023): No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Bronx Highway Vehicle-Miles Traveled								
Personal Vehicle	3,713,844	3,724,456	3,722,846	3,711,812	3,708,024	3,695,064	3,715,400	3,721,962
Taxi/FHV/ Commercial Van	214,057	207,093	209,091	209,160	206,457	210,215	212,459	207,780
Commercial Truck	304,924	310,922	311,500	310,182	310,207	309,811	308,362	305,356
Bus	10,589	10,589	10,589	10,589	10,589	10,589	10,589	10,589
TOTAL	**4,243,414**	**4,253,061**	**4,254,026**	**4,241,743**	**4,235,277**	**4,225,679**	**4,246,811**	**4,245,687**
Bronx Highway Vehicle-Miles Traveled (Difference from No Action Alternative)								
Personal Vehicle	—	10,613	9,002	-2,032	-5,819	-18,779	1,557	8,118
Taxi/FHV/ Commercial Van	—	-6,964	-4,966	-4,897	-7,601	-3,843	-1,598	-6,278
Commercial Truck	—	5,998	6,576	5,257	5,283	4,887	3,438	431
Bus*	—	*	*	*	*	*	*	*
TOTAL	—	**9,646**	**10,612**	**-1,671**	**-8,137**	**-17,735**	**3,396**	**2,271**

* In the BPM, all buses (e.g., Metropolitan Transportation Agency [MTA] New York City Transit, MTA Bus Company, NJ TRANSIT and private operators) were considered insensitive to Manhattan CBD tolling, because such buses were assigned a fixed route and headway based on existing or planned service. Transit vehicles in the model were not allowed to deviate from those routes or headways based on tolls or congestion. Therefore, bus volumes are the same across tolling scenarios.

Table 4A-32. Select Bronx Highways Daily Vehicle-Miles Traveled by Vehicle Type (2023): No Action Alternative and Tolling Scenarios

	NO ACTION	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Select Bronx Highways Vehicle-Miles Traveled								
Major Deegan Freeway	1,119,278	1,115,360	1,114,715	1,106,730	1,105,357	1,103,220	1,111,200	1,113,208
Bruckner Expressway	476,409	472,256	476,060	472,911	467,568	465,258	471,241	472,443
Select Bronx Highway Vehicle-Miles Traveled (Difference from No Action Alternative)								
Major Deegan Freeway	—	-3,918	-4,563	-12,548	-13,921	-16,058	-8,078	-6,070
Bruckner Expressway	—	-4,154	-349	-3,499	-8,842	-11,151	-5,169	-3,966

TRIP SUPPRESSION

Trip suppression is a trip to the Manhattan CBD that would be "canceled" as a result of the Project. The trip would either no longer take place or divert to a different destination outside of the Manhattan CBD. These types of trips are different from trips that switch modes from driving to transit as discussed earlier in this chapter. The BPM includes explicit representations of destination change and mode choice; however, the BPM has a limited accounting for the third and smallest type of trip suppression (i.e., trip cancellation).

It is anticipated that some trips would be canceled due to the implementation of the Project based on similar program implementations in London and Stockholm. In those implementations, there is a strong relationship between trip cancellation and congestion pricing programs, although the available data varies between London and Stockholm. Of the available data, the trends in London and Stockholm similarly show that the implementation of congestion pricing programs are effective in reducing car traffic and suppressing trips to a CBD. After one year of implementing congestion pricing in Central London in February 2003, the number of vehicles entering the Central London CBD charging zone decreased by 18 percent, and there was an average daily decrease of approximately 60,000 trips made to the Central London CBD. Of these 60,000 trips, approximately 50 percent switched to public transit, approximately 20 percent of trips avoided the Central London CBD charging zone, roughly 15 percent switched to car share, and the remaining 15 percent of trips were assumed to be suppressed. In 2020, the program charged a flat weekday fee of £15 (around $20.25) when entering the zone between 7:00 a.m. and 10:00 p.m.

Similarly, after a six-month trial, Stockholm saw a 22 percent decrease in car traffic entering the Stockholm CBD charging zone between 2005 and 2006. Less than 50 percent of car users who stopped commuting into the Stockholm CBD charging zone switched to transit. It can be inferred that the remaining 50 percent or so of trips that were no longer made to the Stockholm CBD were suppressed, transferred to car share, routed elsewhere outside the Stockholm CBD, or switched to take place outside of tolling hours. The Stockholm CBD charges were effective weekdays from 6:30 a.m. to 6:30 p.m., and the price was set at 10 SEK to 20 SEK (US $1.33 to $2.67 at 2006 rates) for off-peak and peak periods.

TAXIS AND FHVS

The tolling scenarios test a variety of tolling policies for taxis and FHVs ranging from charging a toll each time a taxi or FHV enters the Manhattan CBD to a complete exemption from paying the CBD toll. **Table 4A-33** provides an overview of the CBD tolling policy for taxis and FHVs in each tolling scenario. The CBD tolls would be collected in addition to the New York State Congestion Surcharge[29] of $2.50 and $2.75 for taxis and FHVs, respectively, for trips that start, end, or pass through the congestion surcharge zone—Manhattan south of 96th Street.

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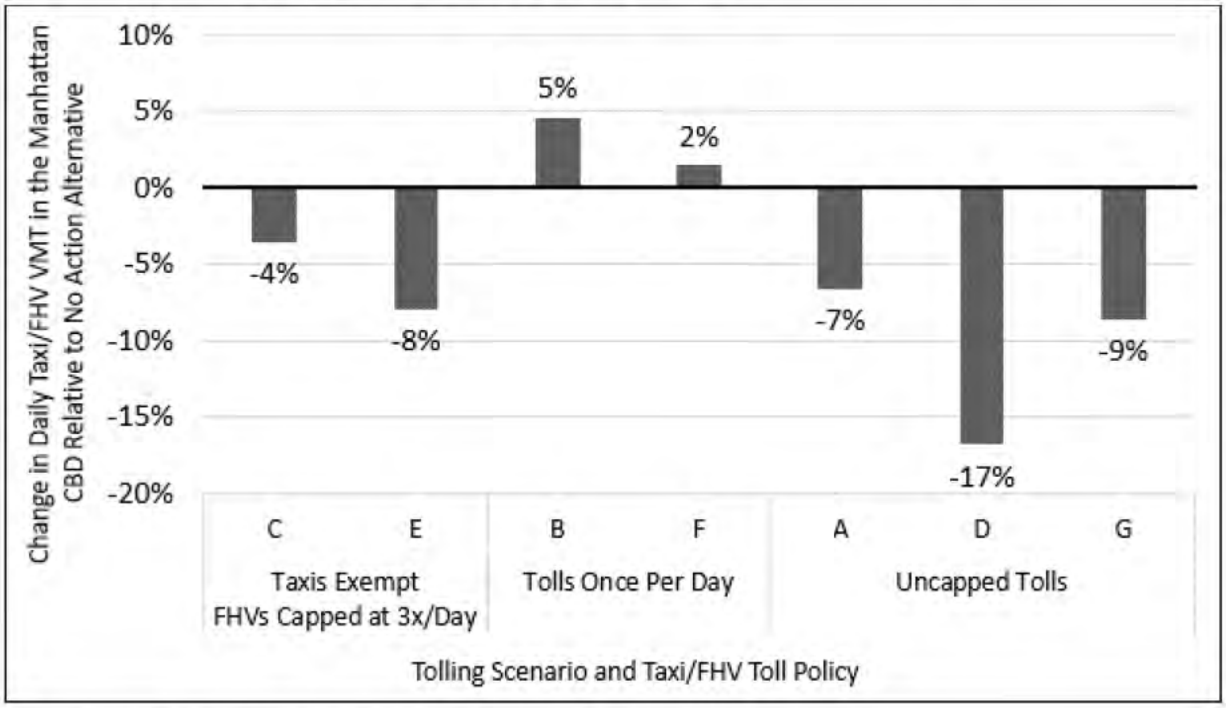
29 Congestion Surcharge. New York City Taxi & Limousine Commission. December 25, 2021. https://www1.nyc.gov/site/tlc/about/congestion-surcharge.page.

Table 4A-33. Taxi and FHV Manhattan CBD Tolling Policy

TOLLING POLICY	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Taxi Manhattan CBD Toll Policy	All Entries	Once per Day	Exempt	All Entries	Exempt	Once per Day	All Entries
FHV Manhattan CBD Toll Policy	All Entries	Once per Day	Up to 3x a Day	All Entries	Up to 3x a Day	Once per Day	All Entries

The CBD tolling policy for taxis and FHVs when combined with varying CBD toll rates would change demand for taxis and FHVs into, out of, and within the Manhattan CBD. **Figure 4A-5** demonstrates how the different tolling policies would affect taxi and FHV VMT. Exemptions and caps decrease the toll burden on taxi/FHV drivers, while increasing the toll rate for other drivers to meet the Project's congestion and revenue objectives. If taxis and FHVs are charged for each trip, the demand for their service would decline, particularly in New York City, reducing trips and better meeting the Project objectives, but creating new direct costs and/or potential job insecurity.

Figure 4A-5. Changes in Daily Taxi/FHV VMT in the Manhattan CBD, CBD Tolling Alternative Tolling Scenarios Compared to the No Action Alternative



Source: Best Practice Model, WSP 2021

Additional Analyses of Taxis and FHVs

In response to concerns expressed during the public outreach process with respect to the anticipated effects of the Project on both taxi and FHV drivers, additional analyses were conducted. Specifically, analyses were done to assess the revenue and traffic effects of implementing Tolling Scenarios A and D with a cap of once per day for taxis and FHVs (like Tolling Scenarios B and F) and implementing Tolling

Scenario D with both taxis and FHVs exempt from the toll. In the following tolling scenarios, the revenue objectives of the Project would be maintained. The results of these analyses are presented as follows:

- **Tolling Scenario A with Taxis/FHVs Capped at Once Per Day.** The estimated value of implementing a cap on taxis and FHVs so that these vehicles would be charged once each day is $100 million in forgone net annual revenue under the tolling rates used in Tolling Scenario A. The cap would result in about 20 percent more taxis and FHVs entering the Manhattan CBD as compared to the original Tolling Scenario A presented earlier in this subchapter. To still meet the congestion and revenue objective of the Project, tolls would need to be raised 10 percent to 15 percent on all vehicle classes in Tolling Scenario A to offset forgone taxi and FHV revenues. This would further reduce personal vehicles and trucks at the Manhattan CBD boundary by 2 percent to 3 percent compared to Tolling Scenario A. However, the decline in personal vehicles and trucks would be mostly offset by the increase in taxis and FHVs entering the Manhattan CBD. As a result, the volumes of all vehicles entering the Manhattan CBD would not change in aggregate.
- **Tolling Scenario D with Taxis/FHVs Capped at Once Per Day.** The estimated value of implementing a cap on taxis and FHVs so that these vehicles would be charged once each day is $150 million to $180 million in forgone net annual revenue under the tolling rates used in Tolling Scenario D. The cap would result in about 25 percent more taxis and FHVs entering the Manhattan CBD compared to the existing Tolling Scenario D. Tolling Scenario D—as presented originally with uncapped tolling of taxis and FHVs—would exceed the annual net revenue objectives of the Project by over $300 million. Thus, it is reasonably expected that a cap on taxis and FHVs so that these vehicles would be charged once each day could be accommodated without needing to raise toll rates presented in Tolling Scenario D.
- **Tolling Scenario D with Taxi/FHV Tolling Exemption.** The estimated value of a taxi and FHV toll exemption is $200 million to $250 million in forgone net annual revenue under the tolling rates used in Tolling Scenario D. Exempting taxis and FHVs from the CBD toll would increase the number of additional taxis and FHVs entering the Manhattan CBD by up to 50 percent compared to the existing Tolling Scenario D. Tolling Scenario D—as presented originally with no exemptions for taxis and FHVs—would exceed the annual net revenue objectives of the Project by over $300 million. Thus, it is reasonably expected that including an exemption for taxis and FHVs so that these vehicles would not be charged could be accommodated without needing to raise toll rates presented in Tolling Scenario D.
- **Tolling Scenario G with Taxis/FHVs Capped at Once Per Day.** A variation of Tolling Scenario G was run to test the impact of adding a one-charge-per-day cap to taxis and FHVs. Adding this cap required increasing tolls on other vehicles by about 10 percent to meet the Project's revenue goal. This toll increase was low enough so as not to notably affect the results from Tolling Scenario G and, importantly, still addresses the concerns regarding commercial truck traffic in the South Bronx, though the number of trucks on the Cross Bronx Expressway at Macombs Road, would shift from 50 to 251, still lower than every other tolling scenario except Tolling Scenario C.

[For the Final EA, the Project Sponsors have committed to new mitigation to address the Project's potential effects on taxi and FHV drivers. Specifically, TBTA will ensure that a toll structure with tolls of no more than once per day for taxis or FHVs is included in the final CBD toll structure.]

"WHO PAYS" ANALYSIS

To better understand the distribution of toll revenue (burdens) and CBD trips (benefits) by geography, an analysis was conducted that quantified the share of revenues paid by drivers from different geographies versus the share of trips made to the Manhattan CBD from each of those same geographies. This analysis became known as "Who Pays." This was conducted using results from the 2023 BPM Tolling Scenarios A through G. **Table 4A-34** contains the results of this analysis. Each cell contains the percentage of total net revenue paid by drivers from a particular geography and the percentage of total trips to the Manhattan CBD made by drivers from that geography. For example, in Tolling Scenario A, Bronx drivers would pay 6.2 percent of total net revenue and would make 6.6 percent of total CBD vehicle trips.

The percentages of CBD toll revenue and trips shown in **Table 4A-34** tend to be more balanced for tolling scenarios that do not offer crossing credits (Tolling Scenarios A, B, and G), while the percentages tend to diverge for tolling scenarios that offer crossing credits (Tolling Scenarios C, D, E, and F).

Table 4A-34. Projected Percentage of Total Revenue/Percentage of Total Trips

GEOGRAPHY	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
New York (Manhattan)	13.5% / 14.0%	13.0% / 13.5%	15.7% / 13.6%	19.6% / 12.5%	17.9% / 12.4%	20.0% / 12.5%	13.1% / 13.5%
Kings (Brooklyn)	19.0% / 17.9%	18.9% / 17.8%	20.3% / 18.7%	17.1% / 16.5%	17.1% / 16.7%	17.5% / 16.5%	19.1% / 18.0%
Queens	17.9% / 16.4%	18.1% / 16.6%	17.7% / 17.6%	15.8% / 16.4%	16.6% / 16.5%	16.4% / 16.1%	18.2% / 16.7%
Bronx	6.2% / 6.6%	6.2% / 6.7%	7.9% / 7.1%	9.9% / 6.6%	9.1% / 6.6%	10.2% / 6.6%	6.3% / 6.8%
Richmond (Staten Island)	1.6% / 1.6%	1.6% / 1.5%	1.7% / 1.8%	1.1% / 1.7%	1.4% / 1.8%	1.4% / 1.7%	1.6% / 1.6%
Long Island	7.6% / 6.8%	7.7% / 6.9%	7.2% / 7.0%	6.3% / 6.7%	6.8% / 6.8%	6.3% / 6.6%	7.7% / 6.9%
Hudson Valley	6.6% / 7.1%	6.6% / 7.2%	8.4% / 7.7%	10.4% / 7.1%	9.4% / 7.1%	10.8% / 7.2%	6.6% / 7.1%
New Jersey	17.7% / 20.0%	17.8% / 20.0%	11.6% / 16.5%	10.0% / 21.9%	11.8% / 21.4%	7.8% / 21.9%	17.5% / 19.6%
Connecticut	2.4% / 2.5%	2.4% / 2.6%	3.1% / 2.8%	4.0% / 2.6%	3.5% / 2.5%	4.1% / 2.6%	2.4% / 2.6%
Other	7.5% / 7.2%	7.5% / 7.3%	6.4% / 7.1%	5.8% / 8.1%	6.5% / 8.4%	5.5% / 8.3%	7.4% / 7.2%

Note: *Revenue* includes only projected CBD toll revenue. Other existing TBTA and PANYNJ tolls, including those on crossings leading directly to or from the Manhattan CBD, are not included in the revenue calculations.

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4A.5 CONCLUSION

This subchapter describes the travel forecasts that were prepared for the opening year (2023) and horizon year (2045) for each of the seven tolling scenarios established to evaluate the CBD Tolling Alternative. (See **Chapter 2, "Project Alternatives,"** for more information on the tolling scenarios and how they vary by the value of the toll based on specific tolling actions such as exemptions, crossing credits, and daily toll caps.)

Overall, the BPM provides a baseline representation of the complicated, dense, and congested transportation network that serves the New York City region. The model forecast results show that compared to the No Action Alternative, the CBD Tolling Alternative would meet the purpose and need and established goals for congestion relief in the Manhattan CBD and raise revenue to support transit capital improvements. This section identifies and summarizes general effects on travel patterns from implementing the Project and describes high-level changes to travel and trip-making decisions as well as effects on the taxi/FHV industry.

4A.5.1 General Effects

All tolling scenarios would result in travel pattern changes that would support congestion relief such as reduced automobile and truck trips to the Manhattan CBD, reduced VMT to and within the Manhattan CBD and regionally, and a shift from auto trips to transit. Percentage reductions in 2023 vehicle trips entering the Manhattan CBD would range from 15.4 percent to 19.9 percent. These travel pattern changes are the basis for many of the impact evaluations found in subsequent chapters of this EA.

- **Transit**: The declines in auto-based trips to the Manhattan CBD would result in increases in transit trips. Transit trips (e.g., commuter rail, subway, bus, tram, and ferry) to the Manhattan CBD from outside the Manhattan CBD would increase between 1 percent and 2 percent, depending on the tolling scenario (see **Table 4A-8**).
- **VMT:** For the tolling scenarios analyzed, each tolling scenario would result in reductions in VMT in the Manhattan CBD, as well as across the region (see **Table 4A-7**). Each tolling scenario has a different combination of toll rates, crossing credits, and exemptions that combined would reduce daily VMT between 7.1 percent and 9.2 percent in the Manhattan CBD. Crossing credits temper daily VMT reductions in the CBD, while leading to greater reductions outside of the CBD. Patterns of VMT changes would be consistent across the region with similar changes in areas identified as environmental justice and non-environmental justice communities.
- **Travel Times**: While the Project would improve travel times to the Manhattan CBD, some areas would experience longer auto travel times to the Manhattan CBD from increases in diversionary trips to avoid the Manhattan CBD via highways in the Bronx and Staten Island.

4A.5.2 Crossing Credits

Four of the seven analyzed tolling scenarios offer a range of crossing credits to vehicles that pay tolls on TBTA and PANYNJ bridges and tunnels. While the location and amount of the crossing credits differ in those tolling scenarios,[30] common general effects include the following:

- Some drivers who continue to drive to the Manhattan CBD would choose a different route based on the introduction of Manhattan CBD crossing credits.
- Crossing credits would increase the attractiveness of TBTA East River facilities (Hugh L. Carey Tunnel, Queens-Midtown Tunnel, and the Robert F. Kennedy Bridge) compared to existing free bridges. The travel model indicates that increased demand for these routes has the effect of increasing auto and truck travel times from much of Long Island to the Manhattan CBD market due to additional congestion in the Queens-Midtown Tunnel. While these effects are observed in the four tolling scenarios that would provide crossing credits, they are less prevalent in the three tolling scenarios that would not provide crossing credits. With crossing credits in place, there are certain travel markets where travel times and congestion could increase due to the Project, while other travel markets could see less congestion compared to tolling scenarios without crossing credits.
- For the Hudson River crossings in three of the tolling scenarios, some drivers bound to the Manhattan CBD from west of the Hudson River would divert to the Lincoln Tunnel and Holland Tunnel based on the availability of crossing credits to offset existing tolls as part of the total vehicle cost with Manhattan CBD tolling. As a result, volumes on the George Washington Bridge to Manhattan would decline; however, this decline is reversed in the tolling scenario that offers crossing credits to George Washington Bridge users.
- Tolling scenarios with crossing credits lead to lower VMT in environmental justice communities than tolling scenarios without crossing credits.

4A.5.3 Diversions/Toll Avoidance

Every tolling scenario would cause diversions of traffic by drivers wishing to avoid or minimize the tolls paid. The particular diversions for different travel markets are explained in more detail in this chapter, but important themes are:

- Modeling of the CBD Tolling Alternative indicates that passenger auto trips (i.e., not truckers) have three basic ways to avoid paying the CBD toll:
  - Choose a new and different path to avoid the CBD toll.
  - Switch to another mode such as transit.
  - Choose not to make the trip to the Manhattan CBD.

[30] Credits offered in tolling scenarios are described in Chapter 2, "Project Alternatives," as well as in the narrative descriptions of the tolling scenarios found in "Appendix 4A.2, Transportation: Travel Forecast Tolling Scenario Summaries and Detailed Tables (2023 and 2045)."

- For trucks, only through-traveling trucks that do not stop in the Manhattan CBD can avoid tolling by switching paths. The modeling of CBD tolling scenarios indicates that the level of tolls imposed on trucks would have an impact on the amount of diverted truck traffic seen outside the Manhattan CBD.
- Trucks of different sizes exhibit different diversion behavior. Because through-traveling small and medium trucks have access to all bridges and tunnels, their potential to divert to non-Manhattan CBD routes is greater than through-traveling large trucks, which face prohibitions and height restrictions in certain tunnels and roadways.

4A.5.4 Taxis and FHVs

Taxis and FHVs are an important part of the CBD transportation network; in addition, taxi and FHV drivers largely identify as minority populations and are therefore an environmental justice population. The CBD tolling policy for taxis and FHVs when combined with varying CBD toll rates would change demand for taxis and FHVs into, out of, and within the Manhattan CBD. In every tolling scenario, taxi and FHV journeys into, out of, or within the Manhattan CBD would decrease between 1 percent and 22 percent. When the taxi and FHV toll is charged only once per day per vehicle, the cost would be spread across multiple trips and passengers during the day, with minimal effect on travel patterns, while taxi and FHV trips would decline the most in tolling scenarios that charge a toll for each entry into the Manhattan CBD.

4A.6 SUMMARY OF EFFECTS

Finally, Table 4A-35 is provided to summarize the effects of the tolling scenarios across various topics. All tolling scenarios would reduce traffic volumes within the Manhattan CBD, but to varying degrees. Tolling Scenario D results in the greatest overall reduction in vehicle trips entering the Manhattan CBD because it has the greatest reduction in daily work trips by automobile. Tolling Scenario E results in the greatest reduction of truck trips traveling through the Manhattan CBD, while Tolling Scenario G minimizes the increase in truck trips diverting through the Bronx. Overall, the tolling scenarios result in a 7 percent to 9 percent reduction in VMT in the Manhattan CBD and less than 1 percent reduction in VMT elsewhere in the regional study area.

Table 4A-35. Summary of Effects of Tolling Scenarios on Regional Transportation Effects and Modeling

TOPIC	SUMMARY OF EFFECTS	LOCATION	DATA SHOWN IN TABLE	TOLLING SCENARIO A	B	C	D	E	F	G	POTENTIAL ADVERSE EFFECT	MITIGATION
Vehicle Volumes	▪ Decreases in daily vehicle trips to Manhattan CBD overall. ▪ Some diversions to different crossings to Manhattan CBD or around the Manhattan CBD altogether, depending on tolling scenario. As traffic, including truck trips, increase on some circumferential highways, simultaneously there is a reduction in traffic on other highway segments to the CBD. ▪ Diversions would increase or decrease traffic volumes at local intersections near the Manhattan CBD crossings.	Crossing locations to Manhattan CBD	% Increase or decrease in daily vehicles entering the Manhattan CBD relative to No Action Alternative	-15%	-16%	-17%	-19%	-20%	-18%	-17%	No	**No mitigation needed.** Beneficial effects
Auto Journeys to Manhattan CBD		Manhattan CBD	% increase or decrease in worker auto journeys to Manhattan CBD relative to No Action Alternative	-5%	-5%	-7%	-9%	-11%	-10%	-6%	No	**No mitigation needed.** Beneficial effects
			Absolute increase or decrease in worker auto journeys to Manhattan CBD relative to No Action Alternative	-12,571	-12,883	-17,408	-24,017	-27,471	-24,433	-14,578		
Truck Trips Through Manhattan CBD		Manhattan CBD	Increase or decrease in truck trips through Manhattan CBD relative to No Action Alternative	-4,645 (-55%)	***[-4,967]*** (-59%)	-5,253 (-63%)	-5,687 (-68%)	-6,604 (-79%)	-6,784 (-81%)	***[-1,734]*** (-21%)	No	**No mitigation needed.** Beneficial effects

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TOPIC	SUMMARY OF EFFECTS	LOCATION	DATA SHOWN IN TABLE	TOLLING SCENARIO A	B	C	D	E	F	G	POTENTIAL ADVERSE EFFECT	MITIGATION
Transit Journeys	▪ Overall decrease in vehicle-miles traveled (VMT) in the Manhattan CBD and region overall in all tolling scenarios and some shift from vehicle to transit mode.	Manhattan CBD	% Increase or decrease in daily Manhattan CBD-related transit journeys relative to No Action Alternative	1% to 3%							No	**No mitigation needed.** No adverse effects
Traffic Results		Manhattan CBD	% increase or decrease in daily VMT relative to No Action Alternative	-9% to -7%							No	**No mitigation needed.** Beneficial effects in Manhattan CBD, NYC (non-Manhattan CBD), north of NYC, and Connecticut; no adverse effects in Long Island and New Jersey
		NYC (non-Manhattan CBD)		-1 to 0%								
		New York north of NYC		-1% to 0%								
		Long Island		Less than (+) 0.2% change								
		New Jersey		Less than (+) 0.2% change								
		Connecticut		-0.2% to 0%								

4B. Highways and Local Intersections

This subchapter presents the highways and local intersections traffic assessment of the CBD Tolling Alternative for the 2023 analysis year.[1] This subchapter provides an overview of the regional highway network and evaluates the potential traffic effects of the CBD Tolling Alternative on key highway segments accessing the Manhattan CBD and along circumferential highways. It also examines the potential change in traffic operations at local intersections that could increase or decrease volumes with the implementation of the CBD Tolling Alternative. Throughout the public outreach process, the potential effects of traffic changes at key locations, many of which are in or adjacent to environmental justice communities, was raised, and are discussed in this subchapter.

4B.1 INTRODUCTION

This subchapter focuses on regional highways at points where they would experience the greatest potential effect of shifts in travel and roadways near Manhattan CBD access points and circumferential routes that avoid the Manhattan CBD. The traffic on local roadways resulting from these shifts was analyzed at intersections, using accepted standards of level of service (LOS) and vehicle delay criteria as the basis for evaluating changes in traffic operations. While the MTA Reform and Traffic Mobility Act (Traffic Mobility Act) exempts the Project from any state or local environmental review, the methodology used for this analysis is based on the State Environmental Quality Review Act (SEQRA).[2]

To evaluate the potential effects of the Project on the highway system and local intersections the following steps were performed and documented in **Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation:"**

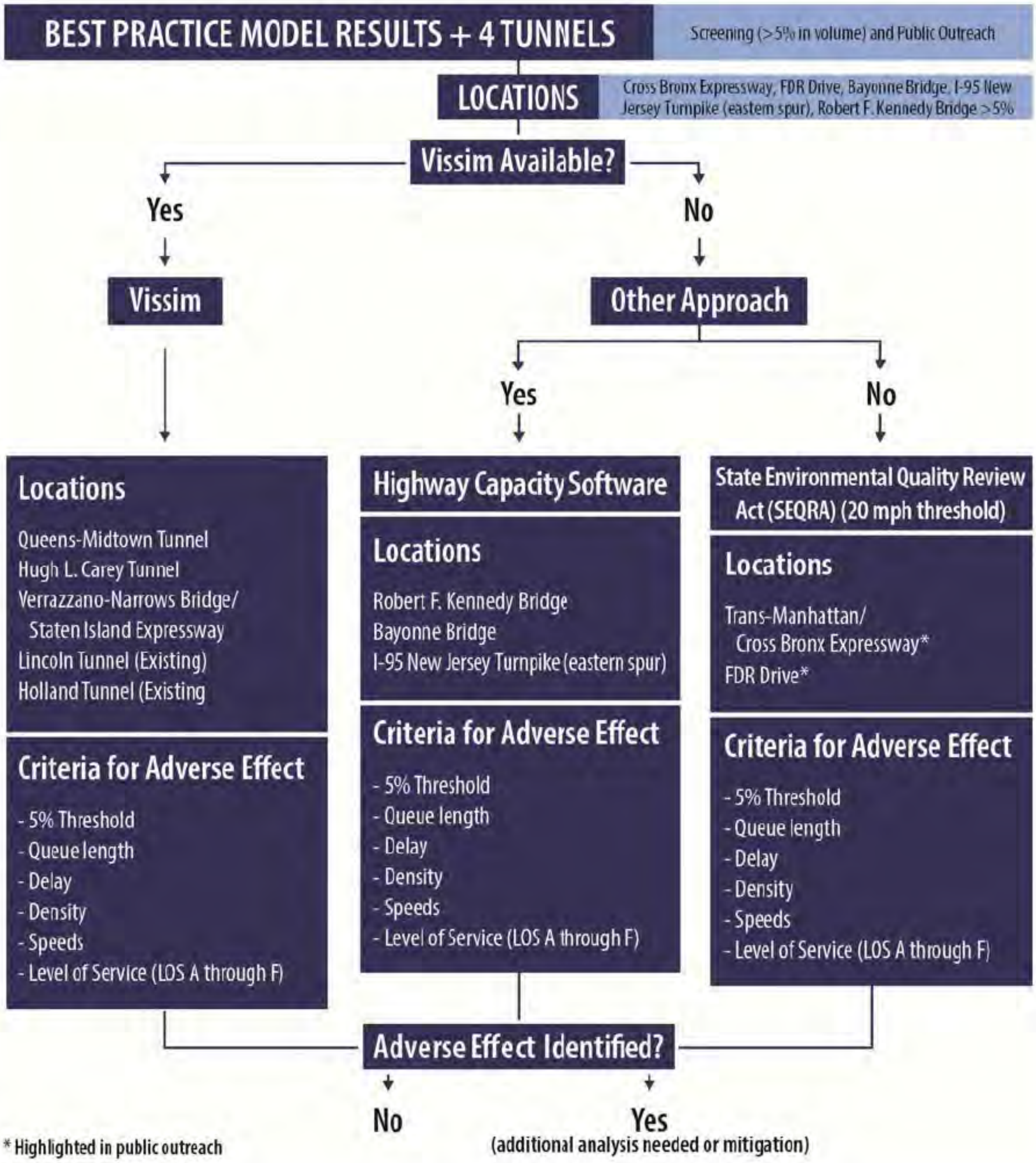
- Used the New York Metropolitan Transportation Council Best Practice Model (BPM) to model regional travel for the seven tolling scenarios, in addition to the No Action Alternative, to identify changes in regional travel demand and patterns (shift in modes and diversion of traffic).
- Assigned BPM traffic flows to the highway and street network for all tolling scenarios.
- Performed a screening analysis using the BPM for all tolling scenarios to identify additional highway segments, in addition to the four tunnels that connect to the Manhattan CBD, with a potential increase in traffic volumes greater than 5 percent. In consultation with the Project Sponsors, 10 highway corridors were analyzed for traffic operations using a using a traffic model or qualitative analyses as shown in **Figure 4B-1**.
- Determined the tolling scenario that would be representative of those with the highest potential to increase traffic along certain alternate routes and at local intersections (**Section 4B.4**).

1 A 2045 horizon year traffic analysis is not required for this Environmental Assessment because the CBD Tolling Alternative would be expected to have a similar effect on traffic in 2045 as the 2023 analysis year due to capacity constraints at the Manhattan CBD crossings, which resulted in very low growth in traffic. However, a 2045 regional transportation and air quality analyses were performed using the BPM in order to meet state and Federal regional conformity requirements.

2 Traffic analyses for intersections were also performed using the methodology in the *New York City Environmental Quality Review (CEQR) Technical Manual*. See **Appendix 4B.5, "Transportation: Traffic LOS CBD Tolling Alternative with Mitigation."**

- To determine whether there was an adverse effect, changes in queue length, delay times, density, speeds, and LOS were assessed (**Section 4B.4**).
- Performed an assessment of effects on roadways in Central Park (**Section 4B.5**).
- In consultations with NYCDOT, identified and analyzed 102 local intersections within and outside the Manhattan CBD, grouping them functionally into 15 local study areas to be assessed (**Section 4B.6**).

Figure 4B-1. Analytical Approach Diagram



Source: WSP, 2022.

Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation," documents the following steps taken to assess the effect of the CBD Tolling Alternative on local intersections:

- Calibrated Synchro traffic model to reflect baseline intersection counts and operations.
- Determined analysis hours.
- Established traffic volumes for the No Action Alternative.
- Screened traffic volumes for various tolling scenarios to identify representative incremental traffic volumes.
- Projected CBD Tolling Alternative incremental traffic volumes and total traffic at each intersection based on regional travel model forecasting and trip assignment.
- Projected potential delays and LOS at key intersections.
- Identified potentially affected study area intersections with potential increases in delays that would exceed SEQRA criteria.[3]
- Developed minor intersection improvements (e.g., signal-timing, striping) to be incorporated into the Project that would reduce delays at the potentially affected intersections and avoid adverse effects.

In both the highway corridors and at the intersection locations, if an adverse effect was found after additional analyses were performed, mitigation was developed.

4B.2 SUMMARY OF EFFECTS OF THE CBD TOLLING ALTERNATIVE TOLLING SCENARIOS AND DETERMINATION OF TOLLING SCENARIO WITH LARGEST INCREASE IN LOCAL TRAFFIC VOLUMES

As set forth in Chapter 2, "Project Alternatives," the proposed CBD Tolling Alternative is being evaluated through a range of tolling scenarios reflecting variations in tolls and application of possible discounts, exemptions, and/or crossing credits that would reduce or eliminate the CBD tolls paid by certain motorists or vehicle classes but would result in generally higher tolls needed to offset potential loss in revenues. These discounts, exemptions, and crossing credits have the potential to alter travel behavior and travel patterns in a manner that could result in increased traffic at some locations, although overall traffic would be reduced for all tolling scenarios.

Tolling Scenario A has the lowest overall CBD tolls with no discounts, no exemptions, and no crossing credits (limited to only those identified in the Traffic Mobility Act). This tolling scenario, if adopted, would result in a reduction of traffic volumes at all Manhattan CBD crossings.

Tolling Scenarios B and C have higher CBD tolls but with some discounts, exemptions, and/or crossing credits. These tolling scenarios would generally reduce traffic; however, Tolling Scenario C, with partial crossing credits, has the potential for a modest shift in traffic from currently toll-free facilities to tolled facilities where the crossing credits would be applied. Tolling Scenario G is similar to Tolling Scenarios A

3 See Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation," for a detailed discussion of the applicable SEQRA criteria used to determine the significance of adverse traffic effects.

and B, with lower toll costs for truck trips in the region. Tolling Scenario G would generally reduce traffic, and the lower truck toll rate would reduce truck diversions to circumferential routes around the Manhattan CBD.

Tolling Scenarios D, E, and F have the highest CBD tolls along with even higher discounts, exemptions, and/or crossing credits. These tolling scenarios would provide a full crossing credit at currently tolled facilities so that motorists would not have to pay both a facility toll and a CBD toll. This would equalize the effective tolls at all Manhattan CBD crossings and provide an incentive for some motorists currently using a toll-free facility (to avoid paying a toll) to shift to a currently tolled facility. The two facilities potentially most impacted by crossing credits are the Queens-Midtown Tunnel and the Hugh L. Carey Tunnel. The Queens-Midtown Tunnel would handle additional traffic volumes diverting primarily from the Ed Koch Queensboro Bridge, and the Hugh L. Carey Tunnel would handle additional traffic diverted from the Brooklyn Bridge and the Manhattan Bridge. The shift of traffic to the Hugh L. Carey Tunnel and the Queens-Midtown Tunnel has the potential of increasing traffic at these tunnels, along the highway approaches leading to the tunnels, and at nearby intersections adjacent to the tunnel portals. Under Tolling Scenarios C, D, and E, *[there would be larger reductions in]* regional vehicle miles traveled (VMT) than under Tolling Scenarios A, B, F, and G. However, for the Manhattan CBD, Tolling Scenarios D, E, and G would have the most *[substantial]* reductions in VMT.

All tolling scenarios would divert some Manhattan CBD through-traffic *[traveling between]* Brooklyn, Queens, Long Island, *[and]* points in New Jersey and beyond to circumferential routes using the George Washington Bridge via the Cross Bronx Expressway and the Verrazzano-Narrows Bridge via the Staten Island Expressway. The higher overall CBD tolls under Tolling Scenarios D, E, and F would result in higher circumferential diversions compared to Tolling Scenarios A, B, C, and G, with lower CBD tolls.

4B.2.1 Summary of Highway Analysis to Determine Representative Tolling Scenario with Largest Increases in Traffic

Preliminary analyses were performed for all tolling scenarios to identify which tolling scenario(s) would have the greatest potential for traffic effects at local intersections and along highway segments, and these tolling scenarios were analyzed in detail. Table 4B-1 presents the change in peak-hour traffic volumes, referred to as the increment, for all tolling scenarios analyzed using the BPM. These increments were used to determine the representative tolling scenario for analysis, the facilities/highways to analyze in detail, and the direction of the highway that needed to be analyzed, inbound or outbound. [4]

The Lincoln Tunnel and Holland Tunnel would have negative increments in both directions, with reduced traffic volumes under all tolling scenarios during the peak hours in the inbound direction. Since these two facilities would generally operate with less or the same delay, they were not analyzed further.

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4 Highways are analyzed by direction using peak hour one-way traffic volumes while VMT, air quality, and noise analyses utilize two-way traffic volumes as inputs. Therefore, the applicable tolling scenario(s) with the highest potential for adverse effects may be different for traffic analyses than the scenario(s) used to analyze VMT, air quality, and noise effects.

Table 4B-1. Peak-Hour Incremental Traffic Volumes: Comparison of Tolling Scenarios*

FACILITY/HIGHWAY	DIRECTION	TIME PERIOD	PEAK-HOUR TRAFFIC VOLUME INCREMENT (VEHICLES) SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Lincoln Tunnel/ NJ Route 495	Inbound	AM	-407	-433	-209	-86	-205	-162	-533
		MD	-434	-478	-283	-147	-269	-109	-508
		PM	-248	-243	-141	-73	-135	-140	-287
	Outbound	AM	-137	-149	-177	-173	-178	-184	-177
		MD	-561	-584	-631	-695	-741	-639	-651
		PM	-629	-672	-647	-784	-888	-805	-770
Holland Tunnel/I-78/ NJ Route 139	Inbound	AM	-206	-231	-127	-78	-164	-143	-309
		MD	-213	-231	-147	-105	-189	-70	-285
		PM	-300	-310	-215	-140	-242	-246	-386
	Outbound	AM	-210	-229	-267	-293	-307	-317	-260
		MD	-311	-354	-422	-463	-519	-465	-403
		PM	-96	-103	-71	-18	-81	-15	-109
Queens-Midtown Tunnel–Long Island Expressway (I-495)	Inbound	AM	-188	-186	253	126	127	125	-192
		MD	-114	-113	224	383	385	379	-120
		PM	-420	-358	241	203	202	202	-409
	Outbound	AM	-61	-65	-67	-25	-30	-24	-63
		MD	-229	-240	-251	163	165	162	-211
		PM	-273	-268	-316	350	335	343	-278
Hugh L. Carey Tunnel–Gowanus Expressway	Inbound	AM	52	80	145	71	71	70	30
		MD	-54	-60	217	482	482	482	-57
		PM	1	7	28	47	44	44	-7
	Outbound	AM	106	100	101	110	107	101	87
		MD	56	64	59	574	574	574	66
		PM	-58	-69	-61	543	543	547	-99

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FACILITY/HIGHWAY	DIRECTION	TIME PERIOD	PEAK-HOUR TRAFFIC VOLUME INCREMENT (VEHICLES)						
			SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
George Washington Bridge[1]	Inbound	AM	43	42	-72	-125	-144	-67	96
		MD	341	472	247	140	233	59	520
		PM	129	184	4	-89	-5	11	198
	Outbound	AM	-14	-8	-3	88	78	117	24
		MD	512	642	707	826	743	754	725
		PM	180	399	409	413	385	415	255
Verrazzano-Narrows Bridge/Staten Island Expressway	Inbound	AM	130	75	17	8	7	14	152
		MD	163	221	100	-8	37	-29	229
		PM	165	161	140	112	135	166	155
	Outbound	AM	77	89	160	230	213	209	124
		MD	211	207	290	400	372	345	248
		PM	170	174	238	240	243	235	210
FDR Drive–Between Williamsburg Bridge and Brooklyn Bridge	Southbound	AM	307	298	356	294	311	314	302
		MD	282	293	281	445	457	458	287
		PM	404	406	440	566	598	666	405
		LN	324	338	348	342	344	370	331
	Northbound	AM	253	298	249	275	285	313	276
		MD	156	231	105	97	107	61	193
		PM	307	298	356	294	311	314	302
		LN	282	293	281	445	457	458	287
Bayonne Bridge	Inbound	AM	421	154	137	275	376	415	145
		MD	273	160	144	266	317	346	142
		PM	239	78	57	161	213	248	87
		LN	47	7	9	37	54	66	9
	Outbound	AM	81	35	41	93	81	68	30
		MD	63	109	86	103	97	103	94
		PM	184	126	131	136	148	192	131
		LN	-1	19	15	12	1	6	25

FACILITY/HIGHWAY	DIRECTION	TIME PERIOD	PEAK-HOUR TRAFFIC VOLUME INCREMENT (VEHICLES)						
			SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Robert F. Kennedy Bridge	Inbound	AM	586	457	481	506	508	487	527
		MD	261	250	233	273	261	250	279
		PM	600	558	510	521	634	581	576
		LN	110	89	86	78	93	117	77
	Outbound	AM	418	374	387	396	396	404	485
		MD	505	569	503	545	474	512	559
		PM	630	597	605	606	612	617	637
		LN	576	569	554	607	598	636	630
I-95 Eastern Spur	Inbound	AM	143	-33	-12	26	98	89	-31
		MD	202	183	130	203	218	193	217
		PM	61	21	6	39	56	65	23
		LN	109	3	3	65	104	138	8
	Outbound	AM	58	53	35	38	53	58	51
		MD	62	76	90	80	63	121	118
		PM	144	100	58	102	80	93	95
		LN	-22	0	-5	-12	-16	-13	0

Source: BPM Facility Volumes (CBD Tolling Alternative minus No Action Alternative).
* Analyzed demand volumes.
1 **Table 4B-21** shows a detailed breakdown of the projected traffic volume increases along the Trans-Manhattan Expressway and Cross Bronx Expressway, which would be lower.

Two facilities crossing the Manhattan CBD—the Queens-Midtown Tunnel and Hugh L. Carey Tunnel—would be expected to have higher increases in traffic volumes inbound under Tolling Scenarios C, D, E, and F compared to other tolling scenarios, some of which have a negative increment. The volume increments for these tolling scenarios generally fall within a very narrow range and are expected to have similar effects. Only the inbound direction was analyzed because that direction experiences higher levels of congestion and delays.

Two facilities that handle circumferential diversion of through Manhattan CBD trips—the Verrazzano-Narrows Bridge and the George Washington Bridge—are expected to have higher increases in outbound (westbound) traffic volumes under Tolling Scenarios C, D, E, and F compared to other tolling scenarios. The George Washington Bridge/Trans-Manhattan/Cross Bronx Expressway corridor was assessed analytically and qualitatively because the data to properly build and calibrate a Vissim microsimulation model were not available (and current data would not be representative given the COVID-19 pandemic). Only the outbound (westbound) direction was analyzed for both the George Washington Bridge (New Jersey-bound) and the Verrazzano-Narrows Bridge (Staten Island bound) because the volume increments and congestion would be higher in that direction.

For all highway analyses, Tolling Scenario D was chosen as the representative tolling scenario due to having daily volumes that land between Tolling Scenarios E and F. In addition, Tolling Scenario D generally presented larger peak-hour volumes. For these reasons, Tolling Scenario D was analyzed in detail. For congested roadway segments, a Vissim microsimulation model was used to analyze the No Action Alternative and the CBD Tolling Alternative for the representative tolling scenario where a model was available. For roadways operating at higher speeds of 40 mph or greater, the Highway Capacity Software (HCS) model was used. A qualitative and analytical method was used to analyze congested roadways where neither a Vissim model nor reliable pre-COVID-19-pandemic traffic data were available since the HCS is not applicable for evaluation of congested roadways. A qualitative approach was also used in instances where all tolling scenarios would result in lower traffic volumes at a facility and its approaches.

4B.2.2 Summary of Intersection Analysis to Determine Representative Tolling Scenario with Highest Potential Increase in Traffic

The number of intersections projected to have an increase of 50 or more vehicles in a peak hour was used as a basis for evaluating the relative potential of each tolling scenario to trigger adverse effects and to determine which tolling scenario(s) to analyze in detail. The tolling scenarios with the highest crossing credits produced the highest number of intersections that would experience an increase of 50 or more vehicles in a peak hour. Because the number of intersections that would be potentially adversely affected correlates directly with the increase in facility crossing volumes feeding those intersections, this methodology was also used to identify which tolling scenario(s) to analyze in detail to evaluate potential adverse effects along highways leading to these crossing facilities. Diversion to circumferential routes that avoid the Manhattan CBD was found to be directly related to the level of CBD tolls (due to CBD toll crossing credits); therefore, the methodology also works to identify which tolling scenario(s) to analyze in detail for circumferential routes. The results of the BPM modeling confirmed that tolling scenarios with the highest tolls (and tolling crossing credits) produced the highest diversions to the Hugh L. Carey Tunnel and Queens-Midtown Tunnel, as well as along circumferential routes.

Table 4B-2 summarizes the number of times the peak-hour volume increment meets or exceeds the threshold of 50 or more vehicles for any given intersection (or intersection approach) within the traffic study areas established for this EA. Peak-hour traffic increments generated by each tolling scenario were assigned to evaluate the potential increase (or decrease) in traffic per the methodology described in **Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation."** This evaluation was the basis for determining the representative tolling scenario to use for detailed traffic impact analysis.[5]

As shown in Table 4B-2, Tolling Scenarios A, B, and G—with the lowest tolls along with the fewest discounts or exemptions, and no crossing credits—would result in an overall reduction in traffic and minimal shift of traffic to alternate routes. Increases in traffic volumes along alternate routes would result in 9, 10, and 10 instances out of 363,[6] respectively, where intersection or approach volumes would increase by 50 or more vehicles in a peak hour. Tolling Scenario C—with higher tolls along with discounts, exemptions, and partial crossing credits—would result in routing changes that lead to 24 instances where peak-hour volumes would increase by 50 or more vehicles at intersections or approaches. Tolling Scenarios D, E, and F incorporate higher tolls and more widely applied crossing credits, discounts, and/or exemptions, leading to 50, 48 and 50 instances out of 363 of an increase of 50 or more peak-hour vehicles at any intersection or intersection approach, respectively.

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5 The 50 or more additional vehicles threshold was used only to determine the representative tolling scenario for detailed traffic analysis; all intersections in the 15 study areas were analyzed regardless of whether traffic volumes increased or decreased.

6 A total of 363 intersection analyses were performed at 102 locations during the AM, MD, PM, and LN peak hours.

Table 4B-2. Instances of Intersections Meeting/Exceeding the Traffic Volume Screening Threshold in an Analysis Hour: Comparison of Tolling Scenarios

STUDY AREA	SCENARIO A	SCENARIO B	SCENARIO C	SCENARIO D	SCENARIO E	SCENARIO F	SCENARIO G
Downtown Brooklyn	2	2	2	0	0	0	2
Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan	0	0	8	18	17	17	0
Hugh L. Carey Tunnel–Red Hook	0	0	0	7	7	7	0
Holland Tunnel–Jersey City	0	0	0	2	0	2	0
Lincoln Tunnel–Manhattan	0	0	0	0	0	0	0
East Side at 60th Street–Manhattan	1	1	1	2	2	2	1
West Side at 60th Street–Manhattan	0	0	0	0	0	0	0
Queens-Midtown Tunnel–Manhattan	0	0	2	5	5	5	0
Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City	1	1	4	9	9	10	1
Robert F. Kennedy Bridge–Queens	2	2	3	3	3	2	2
Robert F. Kennedy Bridge–Bronx	0	0	0	0	0	0	0
Robert F. Kennedy Bridge–Manhattan	3	4	3	3	4	4	3
West Side Highway/Route 9A at West 24th Street–Manhattan	0	0	0	0	0	0	0
Lower East Side–Manhattan	0	0	0	0	0	0	0
Little Dominican Republic–Manhattan	0	0	1	1	1	1	1
TOTAL	**9**	**10**	**24**	**50**	**48**	**50**	**10**

Source: WSP, 2022.

Tolling Scenarios D, E, and F provide the most extensive crossing credits for tolls paid at existing tolled facilities and would result in the greatest shift of traffic to the Queens-Midtown Tunnel and the Hugh L. Carey Tunnel. These tolling scenarios also have the highest tolls, due to the need to offset the revenue loss due to crossing credits, resulting in the highest diversion to circumferential routes via the Verrazzano-Narrows Bridge and the George Washington Bridge. Although Tolling Scenarios D and F have the same number of exceedances of the threshold with 50 instances, Tolling Scenario D was selected for detailed traffic analysis because it has a higher number of potentially affected intersections in the critical Lower Manhattan Study Area. However, it should be noted that Tolling Scenarios D, E, and F are very similar and would be expected to have very similar potential traffic effects; therefore, Tolling Scenario D is considered to be the representative tolling scenario inclusive of Tolling Scenarios E and F.

The Synchro traffic model was used to perform a detailed analysis of intersections for Tolling Scenario D. An additional Synchro analysis was performed in the Downtown Brooklyn study area for Tolling Scenario C, which was determined to have a higher potential for traffic effects in two instances where the increase in traffic volumes is projected to be 50 or more vehicles.

Calibrated Vissim microsimulation traffic models adapted for the CBD Tolling Alternative were used to perform detailed traffic analyses of the highway approaches to the Hugh L. Carey Tunnel and Queens-Midtown Tunnel, which are projected to have the highest increase in traffic volumes under Tolling Scenario D. A Vissim analysis was also performed at the Verrazzano-Narrows Bridge and its approaches to evaluate the potential traffic effects due to circumferential route diversion. An analytical and qualitative traffic analysis was performed at the George Washington Bridge including its approaches, and the Franklin D. Roosevelt (FDR) Drive near the Manhattan Bridge because pre-COVID-19-pandemic data were not available to create a Vissim traffic model at these locations. An estimation of the potential traffic effects was made based on the projected increase in traffic volumes in relation to the projected increase in traffic volumes at the Queens-Midtown Tunnel and the Long Island Expressway where detailed modeling was performed. Additional analyses were completed using HCS for the Bayonne Bridge, the Eastern Spur of I-95 New Jersey Turnpike, and a section of the Robert F. Kennedy (RFK) Bridge from Queens to the ramp connecting with the Manhattan leg of the RFK Bridge.

4B.3 OVERVIEW AND CONTEXT

An extensive network of highways serves the 28-county regional study area (see **Figure 3-1** in **Chapter 3, "Environmental Analysis Framework"**). This section describes the existing highway network at two levels:

- A broad discussion of highways throughout the regional study area
- A more detailed presentation of the highways that directly connect to the Manhattan CBD or are used to bypass the Manhattan CBD

Many of the region's highways connect directly with the bridges, tunnels, and local roadways that access the Manhattan CBD. Other major highways are circumferential in nature and provide regional access, bypassing the Manhattan CBD. The highway network includes several primary interstates (e.g., I-78, I-80, I-84, I-87, and I-95), auxiliary interstate routes (e.g., I-278, I-287, I-495, and I-684), and other limited-access state highways (e.g., NJ Route 3, NJ Route 4, NJ Route 17) and parkways (e.g., Grand Central Parkway, Henry Hudson Parkway). See **Appendix 4B.8, "Transportation: Overview of Highways Throughout the Study Area."**

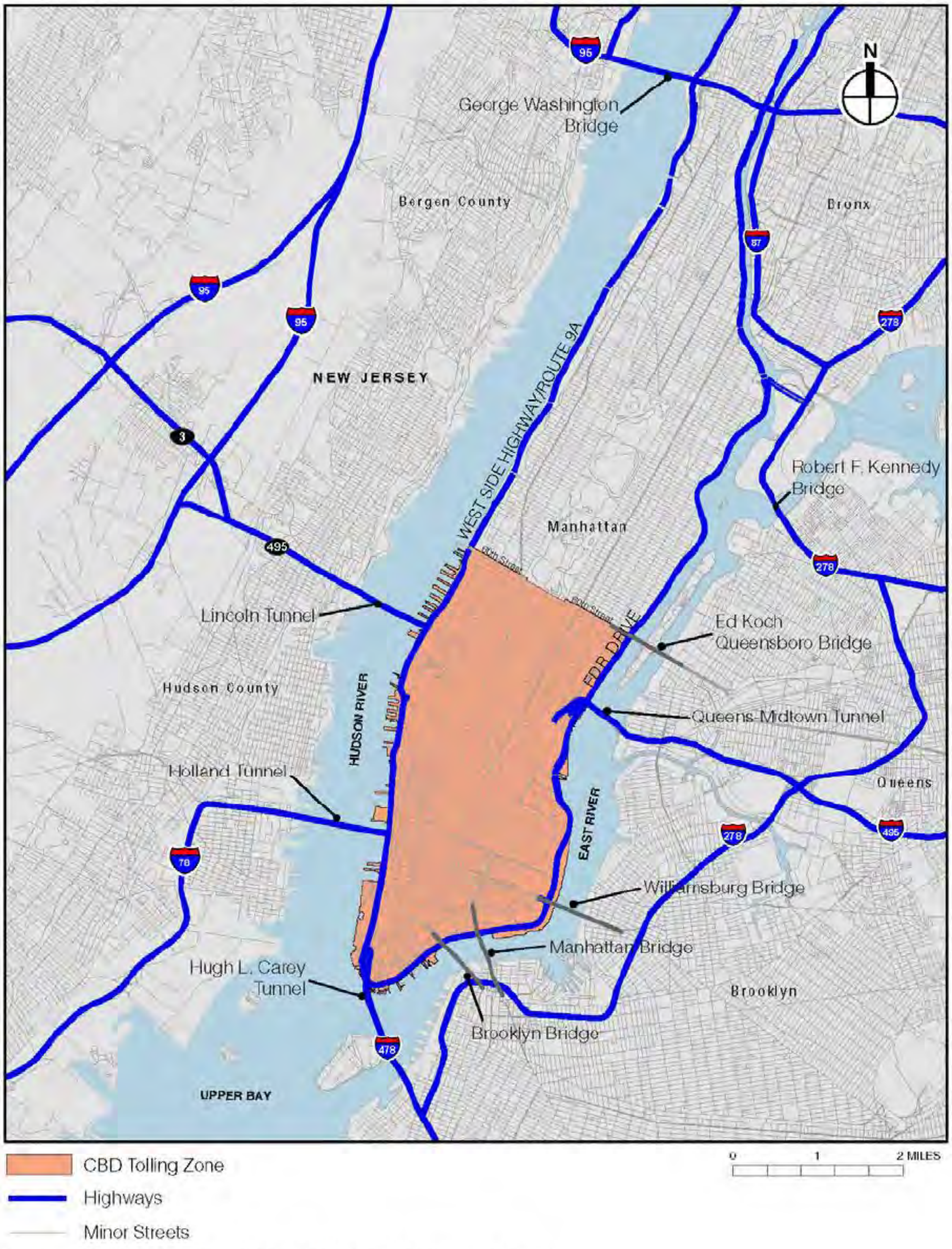
The potential effects on area highways from the Project under the representative tolling scenario would be concentrated on certain highways that directly lead into the Manhattan CBD and those that provide circumferential service around the Manhattan CBD. Direct highway routes to the Manhattan CBD that are unlikely to experience increases in traffic volumes from diversions would be expected to have reductions in traffic across all tolling scenarios and, therefore, a beneficial effect on traffic operations. Locations farther from the Manhattan CBD (or without direct routes to and from the Manhattan CBD) would be less affected as Manhattan CBD traffic becomes more dispersed throughout the region.

4B.3.1 Overview of Roadways and Highways Leading to the Manhattan CBD

This section gives an overview of the key roadways and highways that lead directly to the Manhattan CBD, for the purpose of providing appropriate background and context for the highway and intersection impact analyses later in this subchapter. The roadway descriptions are grouped by crossing location: Uptown Manhattan, Queens, Brooklyn, and New Jersey.

Figure 4B-2 shows the key highways in the area directly leading to the Manhattan CBD.

Figure 4B-2. Highways Leading to the Manhattan CBD



Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

UPTOWN MANHATTAN APPROACHES (60TH STREET CROSSINGS)

The northern boundary of the CBD tolling area inclusive of 60th Street is accessed by two highways and 16 avenues. From west to east, these highways and avenues are listed below, along with the number of lanes at the 60th Street Manhattan CBD boundary:

- **Route 9A** runs along the east side of the Hudson River from Lower Manhattan continuing northward through Upper Manhattan, the Bronx and Westchester County. It is known as West Street from the southern tip of Manhattan to West 14th Street, Eleventh Avenue from West 14th Street until West 22nd Street, Twelfth Avenue from West 22nd Street until West 58th Street, the Joe DiMaggio Highway from West 58th Street to West 72nd Street, and the Henry Hudson Parkway from West 72nd Street through the Bronx. In the Bronx, Route 9A serves as a local arterial up to the northern end of Westchester County. It is a bi-directional highway with six to eight lanes, with an elevated northern section (from West 59th Street to West 72nd Street) and an at-grade southern section south of West 59th Street. Trucks and buses are permissible only on the surface section, south of West 59th Street.
- **Twelfth Avenue** is a one-way, northbound street. It begins at an intersection with West Side Highway/Route 9A at West 54th Streets and continues to West 61st Street with one traffic lane and one parking lane. At West 61st Street, it continues as Riverside Boulevard, which is a two-way street with one traffic and one parking lane in both directions.
- **Eleventh Avenue/West End Avenue** starts at the West Side Highway/Route 9A between West 21st Street and West 22nd Street and continues north along the west side of Manhattan. South of West 34th Street, it is one-way southbound. Between West 34th and West 40th Street it is a two-way street. Between West 40th and West 57th Street, it is one-way southbound. North of West 57th Street, it is a two-way street. The number of traffic lanes varies; at the 60th Street Manhattan CBD boundary, it has two traffic lanes and a parking lane in both directions, plus a striped median/turn lane.
- **Tenth Avenue/Amsterdam Avenue** begins at West 14th Street and carries northbound traffic as far as West 110th Street (Cathedral Parkway), where it then continues as a two-way street. At the 60th Street Manhattan CBD boundary, it has three traffic lanes, a dedicated bicycle lane, and two parking (also used for loading and bus stop locations) lanes.
- **Ninth Avenue/Columbus Avenue** is a southbound street. It ends south of West 14th Street at Gansevoort Street in the West Village and extends uptown to West 59th Street, where it becomes Columbus Avenue. Columbus Avenue extends through the Upper West Side to West 110th Street, where it changes name to Morningside Drive, and runs north through Morningside Heights to West 122nd Street. At the 60th Street Manhattan CBD boundary, it has three traffic lanes, two parking lanes, and a protected bicycle lane.
- **Broadway** originates in Lower Manhattan and runs diagonally across the Manhattan street grid through the length of Manhattan, through the Bronx and into Westchester County to counties north of New York City. The street width and street direction vary widely, and in certain segments such as in Times Square, the street has been pedestrianized. At the 60th Street Manhattan CBD boundary, it has three traffic lanes and one parking lane in each direction, separated by a landscaped median.

- **Eighth Avenue** is a one-way northbound street that starts in the West Village at the intersection of Hudson Street and Bleecker Street and runs north to Columbus Circle at West 59th Street and then changes name to become Central Park West. North of West 110th Street the name changes to Frederick Douglass Boulevard. This avenue ends north of West 155th Street and merges into Harlem River Drive. At the 60th Street Manhattan CBD boundary, it has two traffic lanes, one parking lane, one loading/no standing lane, and a protected bicycle lane.
- **Seventh Avenue** is a one-way southbound street that originates at West 59th Street/Central Park South and runs south to the intersection of Carmine Street/Clarkson Street and Seventh Avenue, before turning into Varick Street. The northern boundary of the avenue connects to the Central Park roadway system, which is open to authorized vehicles part time.
- **Sixth Avenue** is a one-way northbound street that starts in Tribeca at the intersection of Church Street and Franklin Street and runs north to West 59th Street/Central Park South. The northern edge of the avenue connects to the Central Park roadway system, which is open to authorized vehicles part time.
- **Fifth Avenue** is a southbound avenue that originates at the Harlem River Drive near 143rd Street and passes through Manhattan along the east side of Central Park and through Midtown to Washington Square Park in Greenwich Village. At its northern end, the avenue is fed by both the Harlem River Drive and Madison Avenue Bridge (from the Bronx) and is bisected by Marcus Garvey Park near 120th Street. At the 60th Street Manhattan CBD boundary, it has two traffic lanes, one bus lane, one parking lane, and a turn lane.
- **Madison Avenue** is a north–south avenue beginning at Madison Square Park (at East 23rd Street) to the Madison Avenue Bridge over the Harlem River at West 142nd Street. Madison Avenue carries one-way northbound traffic from East 23rd Street to East 135th Street. Between East 135th Street and East 142nd Street, Madison Avenue only carries traffic to/from the Madison Avenue Bridge, though there is also a service road on this segment named Madison Avenue that is not connected to the rest of the avenue in Manhattan and carries southbound traffic only from the Harlem River Drive. At the 60th Street Manhattan CBD boundary, it has two traffic lanes, a double bus lane, and a turn lane.
- **Park Avenue** extends from Astor Place in Cooper Square to East 138th Street and carries both northbound and southbound traffic south of East 132nd Street. The avenue is called Union Square East between East 14th and East 17th Streets, and Park Avenue South between East 17th and East 32nd Streets. Between East 33rd Street and East 40th Street, there is a one-lane northbound vehicular tunnel. Park Avenue splits by direction to wrap around Grand Central Terminal and other adjacent buildings at East 42nd Street. It rejoins at East 45th Street. North of East 97th Street, the landscaped median is replaced by Metro-North Railroad’s four tracks as it transitions from tunnel to an elevated structure. At the 60th Street Manhattan CBD boundary, Park Avenue has three traffic lanes and a parking lane in each direction, separated by a wide landscaped median.
- **Lexington Avenue** carries southbound, one-way traffic from East 131st Street to Gramercy Park at East 21st Street. At the 60th Street Manhattan CBD boundary, it has three traffic lanes, one weekday-only curb bus lane (parking lane on weekends), and one parking lane.

- **Third Avenue** begins at the intersection of Cooper Square and East 6th Street and continues north to 128th Street. It carries two-way traffic between East 6th Street and East 24th Street, whereupon it is one-way, northbound until it terminates at 128th Street in Manhattan. At the 60th Street Manhattan CBD boundary, it has four traffic lanes, one parking lane, and a turn lane.
- **Second Avenue** carries southbound traffic from Harlem River Drive at East 128th Street to Houston Street. South of Houston Street, the roadway continues as Chrystie Street south to Canal Street. At the 60th Street Manhattan CBD boundary, it has five traffic lanes, one bus lane, and a bicycle lane. Second Avenue provides a connection to the Ed Koch Queensboro Bridge and the Queens-Midtown Tunnel.
- **First Avenue** begins at Houston Street and travels northbound for over 125 blocks before terminating at the Willis Avenue Bridge into the Bronx at the Harlem River near East 126th Street. South of Houston Street, the roadway continues as Allen Street south to Division Street. First Avenue is a one-way, northbound street. At the 60th Street Manhattan CBD boundary, it has four traffic lanes, one bus lane and a protected bicycle lane.
- **Sutton Place/York Avenue** is a two-way street between East 53rd and East 92nd Streets. At the 60th Street Manhattan CBD boundary, York Avenue has two traffic lanes and one curb lane in each direction. Both curb lanes are used as a bus stop/additional travel lane.
- **FDR Drive** follows the East River shoreline between the Battery Park Underpass and approximately East 125th Street where it continues to Dyckman Street as the Harlem River Drive. It is a limited-access highway with interchanges at principal east–west streets. It also provides direct connections to the Brooklyn, RFK and George Washington Bridges. Commercial vehicles are prohibited on the FDR Drive, and there are height restrictions along its route.

Connections to the north end of Manhattan are provided by the George Washington Bridge (I-95), the Alexander Hamilton Bridge (I-95), the Henry Hudson Parkway and Henry Hudson Bridge, the RFK Bridge, and eight local roadway bridges that cross the Harlem River from the Bronx.

QUEENS CROSSINGS

The **Ed Koch Queensboro Bridge** connects the Upper East Side of Manhattan to Long Island City, Queens. It is a two-level bridge over the East River, passing over Roosevelt Island. In Queens, it is fed by Queens Boulevard, Northern Boulevard, 21st Street, and other local streets. The upper level of the bridge has four lanes, with two vehicular lanes in each direction. The lower level has five vehicular lanes and one shared-use bicycle and pedestrian path. During the AM time period, the upper-level southern roadway operates as a high-occupancy vehicle (HOV) contra-flow into Manhattan. The inner four and the southernmost lanes are used for automobile traffic. The northernmost lane was converted into a pedestrian walk and bicycle path in 2000.[7] In Manhattan, there are exits from the upper level of the bridge to East 62nd Street and East 63rd Street and from the lower level of the bridge to Second Avenue and East

[7] NYCDOT plans to convert the southern outer roadway on the lower level to a dedicated pedestrian path and to move pedestrians from the existing dedicated shared bicycle/pedestrian lane on the northern outer roadway to the southern outer roadway. It was assumed that this plan will be implemented by 2023 and was therefore included in the No Action Alternative roadway network.

60th Street. There are entrances from Second Avenue, East 57th, East 58th, and East 59th Streets. There is no toll to cross this bridge.

The **Queens-Midtown Tunnel** is a vehicular tunnel under the East River from the east side of Manhattan, in the residential neighborhood of Murray Hill, to the Hunters Point District of Long Island City. In Queens, the tunnel merges directly into the Long Island Expressway (I-495), which is approximately 1.5 miles west of the Long Island Expressway interchange with the Brooklyn-Queens Expressway (BQE). There are two tubes—one eastbound and one westbound—with two travel lanes each, although one lane of the eastbound tube is operated contra-flow during the AM peak period. In Manhattan, the tunnel is accessed via East 34th Street, East 36th Street, and Second Avenue. Vehicles exiting the tunnel can access East 37th Street or East 41st and East 34th Streets via Tunnel Exit Street. The TBTA collects tolls in both directions.

BROOKLYN CROSSINGS

The **Williamsburg Bridge** connects the Lower East Side of Manhattan at Delancey Street with the Williamsburg neighborhood of Brooklyn. In Brooklyn, it is fed by the BQE (I-278) and various local streets. In Manhattan, it is primarily fed by Delancey Street. The Williamsburg Bridge has eight lanes of vehicular traffic, two subway tracks, a pedestrian walkway, and a bikeway. There is no toll to cross this bridge.

The **Manhattan Bridge** connects Lower Manhattan at Canal Street to Downtown Brooklyn at Flatbush Avenue. In Manhattan, it is primarily fed by Canal Street. In Brooklyn, it is fed by the BQE (I-278), Flatbush Avenue, and various local streets. The Manhattan Bridge has seven lanes of vehicular traffic, four subway tracks, a pedestrian walkway, and a bikeway. There is no toll to cross this bridge.

The **Brooklyn Bridge** connects Lower Manhattan near City Hall to Downtown Brooklyn. In Manhattan, it is fed by the FDR Drive, Center Street/Park Row, and other local streets. In Brooklyn, it is fed by the BQE (I-278), Cadman Plaza, and various local streets. The bridge has two inbound travel lanes, three outbound travel lanes, and a pedestrian path. A travel lane in the Manhattan-bound direction was recently converted into a two-way bicycle lane, which is included in the No Action Alternative roadway network. There is no toll to cross this bridge, and commercial vehicles are prohibited.

The **Hugh L. Carey Tunnel** (I-478) connects the southern tip of Manhattan with Red Hook in Brooklyn. There are two tubes—one northbound and one southbound—with two travel lanes each. During the AM and PM, one of the lanes operates in a contra-flow direction to provide more peak direction lane capacity. In Manhattan, the tunnel is fed by West Side Highway/Route 9A and local streets. In Brooklyn, it is fed by the BQE (I-278), the Gowanus Expressway, Prospect Expressway, and local streets. The TBTA collects tolls in both directions.

NEW JERSEY CROSSINGS

Three vehicular Hudson River crossings provide connections between New Jersey and Manhattan of which only the two tunnels connect directly to the Manhattan CBD. The Port Authority of New York and New Jersey collects tolls on the following crossings in the eastbound direction.

- The Holland Tunnel is a vehicular tunnel under the Hudson River, connecting Lower Manhattan and Jersey City. In New Jersey, it is fed by the New Jersey Turnpike Extension (I-78), the Pulaski Skyway (US 1/9), and local roadways. The tunnel consists of two tubes, with two traffic lanes in each tube. The northern tube, which carries westbound traffic, originates at Broome Street in Manhattan between Varick and Hudson Streets and continues to 14th Street east of Marin Boulevard in Jersey City. The southern tube, carrying eastbound traffic, originates at 12th Street, east of Marin Boulevard, in Jersey City, New Jersey, and surfaces at the Holland Tunnel rotary in Manhattan just south of Canal Street.
- The Lincoln Tunnel is a vehicular tunnel under the Hudson River, connecting Midtown Manhattan and Weehawken, New Jersey. The tunnel consists of three vehicular tubes, with two traffic lanes in each tube. The center tube contains reversible lanes and is heavily used by buses, particularly during the morning peak when it serves as a de facto final leg of the Exclusive Bus Line (XBL) along NJ Route 495 leading to the Lincoln Tunnel. The northern and southern tubes exclusively carry westbound and eastbound traffic, respectively. In New Jersey, the Lincoln Tunnel is fed by NJ Route 495, which connects to the New Jersey Turnpike and NJ Route 3. In Manhattan, it is fed by Ninth and Eleventh Avenues, and a combination of local streets with dedicated ramps to the Port Authority Bus Terminal.

4B.4 HIGHWAY ASSESSMENT

4B.4.1 Methodology

TRAFFIC ASSIGNMENT

The BPM was used to determine projected changes in traffic volumes at bridges, tunnels, and/or highways crossing into or out of the Manhattan CBD, along major north–south roadways in Manhattan, and along bypass routes including the Verrazzano-Narrows Bridge, George Washington Bridge, and RFK Bridge and their approaches. This increase or decrease in volume is referred to as the BPM increment. The initial 2017 BPM forecast volumes were compared to observed traffic volumes for 2017 and then calibrated at each facility within each sector to account for over- or under-assignment of trips by the BPM as detailed in the methodology for trip assignments in Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation."[8]

To evaluate the potential effects of the Project on the highway system, 10 highway corridors potentially affected were identified using the BPM and assessed as described below:[9]

- Long Island Expressway (I-495) leading to the Queens-Midtown Tunnel

[8] Additional adjustments were made to account for a bounce back factor to adjust modeled demand in consideration of available capacity at any given facility when drivers would likely quickly return to their original route choice due to higher congestion and delays along the diversion route. The bounce back traffic volumes were subtracted from the initial CBD Tolling Alternative facility traffic volumes and added back to the original facility traffic volumes. Please see Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation" for additional information on this methodology.

[9] These corridors were initially identified using the BPM, which showed traffic volume increases along these corridors for some tolling scenarios. Subsequent post-processing was used to determine the volume increment after adjusting for calibration variance and capacity constraints. Subsequent BPM screening runs were made for all tolling scenarios to identify additional highway segments that are projected to have volume increases greater than 5 percent.

- Gowanus Expressway leading to I-278 Hugh L. Carey Tunnel
- Staten Island Expressway leading to the Verrazzano-Narrows Bridge
- I-78 approach to the Holland Tunnel[10]
- NJ Route 495 approach to the Lincoln Tunnel
- Trans-Manhattan/Cross Bronx Expressway between the George Washington Bridge and I-87[11]
- FDR Drive—East 10th Street to Brooklyn Bridge
- The Bayonne Bridge and Approaches
- Eastern Spur of I-95 New Jersey Turnpike
- RFK between Queens and Ramps to/from Manhattan

Refer to **Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation,"** for more information about the analysis methodology. It should be noted that throughout the public consultation period, concerns were expressed regarding potential traffic impacts on several of these highway corridors, given their proximity to environmental justice communities.

Two of the 10 corridors, the NJ Route 495 approach to the Lincoln Tunnel, and the I-78 approach to the Holland Tunnel were assessed analytically for the Existing conditions and qualitatively for the No Action Alternative and the CBD Tolling Alternative since there would be a net reduction in traffic under the analyzed tolling scenarios (Tolling Scenarios D, E, and F) and a higher net reduction in traffic for all other tolling scenarios. Therefore, these two corridors would be expected to have fewer delays and improved traffic operations under all tolling scenarios.

The remaining eight highway corridors analyzed would be expected to have higher traffic volumes at certain locations for some tolling scenarios. A variety of analytic tools and methods were used to evaluate the effects of the CBD Tolling Alternative, depending on the level of congestion and the appropriateness of the use of available models. *[[12]]*

With highway peak-hour traffic assignments, and particularly in the absence of detailed Vissim microsimulation modeling, SEQRA and National Environmental Policy Act evaluations have used an initial assessment of incremental volumes as a more qualitative measure of potential effect. This is essentially an estimate of whether the variation in total volume falls within a reasonable band of typical volume variations that could be expected with or without a proposed project and where there would not be a noticeable change in speeds, travel times, or delays. For assessment purposes, it is assumed to be a change of 5 percent or less under congested conditions at LOS E or LOS F[13] based upon the analyzed effects of such

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10 There was a small net decrease in traffic volumes at the Holland Tunnel approaches since the traffic reduction due to CBD tolling was greater than diverted traffic to the facility.

11 An analytical and qualitative analysis was performed at the George Washington Bridge and its approaches and along the FDR Drive south of East 10th Street because a Vissim model was not available for this location.

[12 The highway assessment considered the effects of the CBD Tolling Alternative using the tolling scenario with the highest potential diverted traffic volumes, Tolling Scenario D. For the Final EA, the Project Sponsors committed to additional mitigation measures (see Chapter 16, "Summary of Effects," Table 16-2). These new mitigation commitments neither require a change in the tolling scenarios used for the analyses in the EA nor change the fundamental conclusions of the EA (see Chapter 3, "Environmental Assessment Framework," Section 3.3.3).]

13 Under SEQRA, a higher increase in volume is not considered to have an adverse effect if the LOS for the build condition is D or better.

volume increases where microsimulation was performed. If that is determined to be the case, then it can be expected that there would be no adverse effect.

For three highway locations, there was a Vissim model available which was adapted and used to analyze the potential traffic effects of the CBD Tolling Alternative. Each model was recalibrated to the existing condition volumes, geometry, and travel times. This type of model is particularly useful under congested conditions but can also be used at non-congested locations.

For three highway locations without an available Vissim model (the Bayonne Bridge and approaches, the eastern spur of I-95 New Jersey Turnpike, and the RFK Bridge between Queens and ramps to/from Manhattan), the HCS was used to evaluate the incremental traffic volume and obtain performance measures including change in delay and LOS. HCS models cannot be used effectively under congested conditions where the volume/capacity ratio is greater than 1. None of the models exceed the volume/capacity ratio threshold under any condition.

For two congested highway segments without an available Vissim model (the Trans-Manhattan Expressway/Cross Bronx Expressway and the FDR Drive south of East 10th Street), and where the HCS methodology is not appropriate, evaluation of the incremental traffic volume change provides the basis for the assessment of potential adverse effects.[14]

HIGHWAY ANALYSIS METHODOLOGY AND DETERMINATION OF POTENTIAL ADVERSE EFFECTS

To determine whether diversions of traffic to highway segments from new tolls are significant, FHWA typically consults with state sponsoring agencies—such as NYSDOT as well as, in this case, TBTA, an affiliate of MTA, a New York State public benefit corporation—with expertise in transportation analyses, to determine the appropriate criteria. After careful review of how other state agencies have applied SEQRA to determine the significance of diversionary effects on highways, along with detailed Vissim or HCS analyses used to evaluate roadway stress thresholds, TBTA and NYSDOT, in consultation with NYCDOT, have agreed that the following criteria are appropriate for determining the significance of traffic effects along highways potentially affected by the Project:

- Under very congested conditions, at speeds of 20 mph or less, an increase in traffic volumes of up to 5 percent would not be considered significant.
- At speeds over 20 mph, an increase in traffic volume of up to 10 percent would not be considered significant.

The above guidelines are intended as a screening threshold under congested conditions. Highway segments on the fringe of the threshold would be carefully evaluated. Cases where highway segments surpass the volume threshold but would have only a minimal degradation in traffic operations and speed would not be considered as having an adverse effect. Determination of adverse traffic effects needs to consider the overall trip length and the variability in travel time that affects user perceptions of travel time. In general,

[14] A similar approach was used for the *Tappan Zee Bridge Hudson River Bridge Crossing Project FEIS*, Vol. 1, Chapter 4, Page 4-18.

based on modeling results along congested and uncongested corridors, the 5 percent and 10 percent thresholds would produce decreases in speeds and increases in travel times that would be relatively small within the context of average travel times in the New York City area; therefore, the change in delays and travel times would not be noticeable to most motorists. More information on the highway screening process can be found in **Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation."**

SEQRA CRITERIA USED TO DETERMINE ADVERSE TRAFFIC EFFECTS FOR HIGHWAYS

Where a detailed traffic analysis was performed using the Vissim model or HCS an additional SEQRA criterion was applied to determine adverse highway effects that relies on an increase in delay of 2.5 minutes or greater. This criterion was derived from an examination of average weekday travel times to the Manhattan CBD from the outer Boroughs based on FHV recorded travel time and distance between passenger pickups and drop-offs prior to COVID-19 and during spring 2022 when average travel times rebounded to pre-pandemic levels.

Average travel times to the Manhattan CBD from the outer boroughs during the weekday between 6:00 a.m. and 8:00 p.m. vary from about 35 minutes from Brooklyn, 45 minutes from the Bronx, 45 minutes from Queens, and about 58 minutes from Staten Island. A 2.5 minute increase in travel time under the SEQRA threshold would represent about a 5 percent increase in total travel time, depending on the trip origin, with shorter trips experiencing a higher percent change and longer trips experiencing a smaller percent change in travel time. See **Appendix 4B.7, "Transportation: Average Travel Time by Borough."**

Because *[an]* increase in travel time *[of less than 2.5 minutes]* would not be noticeable to most drivers over the length of the average trip, *[an increase of this magnitude]* is an appropriate threshold for determining adverse traffic effects. This threshold was applied at all locations where a detailed traffic analysis was performed. Where a detailed traffic analysis was not performed due to the lack of availability of a calibrated Vissim model, or where reliable preCOVID19 traffic data were not available, the following SEQRA criteria were used to determine adverse effects: an increase in traffic volumes greater than 5 percent at speeds of less than 20 mph, or an increase in traffic volumes greater than 10 percent at speeds of 20 mph or higher.

It should be noted that the average travel time savings within the Manhattan CBD is estimated at about 4 minutes inbound and 4 minutes outbound which would offset any potential increases in travel times to the Manhattan CBD that would be experienced by some drivers under certain tolling scenarios.

MICROSIMULATION MODEL

Vissim microsimulation models were developed[15] along the key highway segments potentially affected under Tolling Scenario D, which is representative of the tolling scenarios (including Tolling Scenarios E and F), to simulate vehicular movements in a dynamic setting and to create a virtual environment to replicate

15 Calibrated Vissim models were derived from previous studies, where available, and adapted and updated for the Project traffic study. Vissim models were not available for the Trans-Manhattan Expressway/Cross-Bronx Expressway corridor and the FDR Drive corridor. These two corridors were analyzed using a combination of analytical and qualitative methods. As noted in **Section 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA Evaluation,"** current data would not be representative due to the pandemic and thus could not be used to develop a Vissim model for certain roadways.

traffic conditions. These models were calibrated based on 2019 existing conditions, including traffic volumes processed[16] by the model, average speed, and observed queue lengths. Processed volumes reflect the number of vehicles that were able to enter the simulation model and traverse the analyzed segment within the analysis time period. Vehicles that are not processed in the analysis time period are considered to be the unmet demand and are therefore in queue outside of the simulated area at the end of the analysis time period. Average speed is calculated over the length of the analyzed segment for the processed vehicles. Observed queue lengths are recorded for vehicles that enter the simulation model. Unmet demand is assumed to be the additional vehicle queue in the real world that would be added to the end of the observed queue in the model. Once the Vissim models were calibrated, traffic was adjusted to 2023 by adding the No Action Alternative incremental volume[17] derived from the No Action Alternative BPM to evaluate the No Action Alternative traffic conditions. Measures of performance included traffic density, speed, delays, and LOS.

For the highway analysis, the Vissim modeling focused on the 3 weekday peak 1-hour periods (AM, midday [MD], and PM) in the Manhattan-bound direction where queuing and delays on the highway network would be expected to be the most severe for the tolling scenario with the largest increases in traffic. The peak 1-hour period for the AM, MD, and PM periods vary by highway corridor and are not the same for each corridor. These models produce density outputs that enabled the evaluation of the increase in density and delays between the No Action Alternative and the CBD Tolling Alternative.

HIGHWAY CAPACITY SOFTWARE ANALYSIS

HCS[18] analyses were performed along three highways where existing speeds were about 40 mph or higher during the AM, MD, and PM peak hours:

- RFK-Queens leg
- Bayonne Bridge
- New Jersey Turnpike (I-95) Eastern Spur

The HCS provides density, LOS, speed, and measures of performance where the LOS is E or better. At LOS F, the HCS does not provide speed and density as outputs.

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16 Processed traffic volumes is a measure of performance representing the ability of a roadway to meet traffic demand. When the processed volume is less than the traffic demand, the excess volume is converted to queues which result in increased travel times.

17 Incremental volumes were added to the No Action Alternative condition to account for network changes implemented by NYCDOT including a dedicated bike lane on the Brooklyn Bridge, a dedicated bike lane on the Ed Koch Queensboro Bridge, geometric changes at some intersections, and the reduction in travel lanes along portions of the BQE from three lanes to two lanes in each direction.

18 The Highway Capacity Software (HCS) is a macroscopic traffic simulation software that implements the methodology in the *Highway Capacity Manual* (HCM) 6th Edition. This tool is useful when speeds are generally 40 mph or higher. It provides LOS, speed, and density as measures of performance. At LOS F, this software does not provide useful output and, therefore, cannot be used effectively under congested conditions.

SUMMARY OF ANALYTICAL TOOLS AND CRITERIA USED TO DETERMINE ADVERSE EFFECTS

Table 4B-3 summarizes the analytical tools and the criteria used to determine adverse effects for the 10 highway study locations.

Table 4B-3. Analysis Type and Criteria Used for the Determination of Adverse Effects

ANALYSIS LOCATION[1]	% CHANGE IN VOLUME (SEQRA)	NO ACTION SPEED AT FACILITY	PASS SCREENING ?	ANALYSIS TYPE	RESULT OF ADDITIONAL ANALYSIS	CRITERIA USED TO DETERMINE ADVERSE EFFECT	ADVERSE EFFECT?
Holland Tunnel	Traffic volumes decrease	< 20 mph	Yes	No further analysis	N/A volumes decreased	> 5% volume increase	No
Lincoln Tunnel	Traffic volumes decrease	< 20 mph	Yes	No further analysis	N/A Volumes decreased	> 5% volume increase	No
QMT/LIE	> 5%	< 20 mph	No	Vissim model	Up to 4 min additional delay	> =2.5 minutes of increased delay	Yes
HCT	> 5%	< 20 mph	No	Vissim model	Up to 2.3 min additional delay	> =2.5 minutes of increased delay	No
VNB/SIE	> 10%	>= 20 mph	No	Vissim model	< 10 second increase in delay	> =2.5 minutes of increased delay	No
CBX/TME	> 5%	< 20 mph	No	SEQRA Volume Threshold	No additional analysis	> 5% volume increase	Yes
FDR Drive	> 5%	< 20 mph	No	SEQRA Volume Threshold	No additional analysis	> 5% volume increase	Yes
RFK Bridge	> 10%	>=20 mph	No	HCS	Minor changes in density/speed	> =2.5 minutes of increased delay*	No
Bayonne Bridge	> 10%	> =20 mph	No	HCS	Minor changes in density/speed	> =2.5 minutes of increased delay*	No
Eastern Spur of NJ Turnpike	> 10%	> =20 mph	No	HCS	Minor changes in density/speed	> =2.5 minutes of increased delay*	No

Source: WSP, 2022.

1 QMT-Queens-Midtown Tunnel; LIE-Long Island Expressway; HCT-Hugh L. Carey Tunnel; VNB-Verrazzano-Narrows Bridge; SIE-Staten Island Expressway; CBX-Cross Bronx Expressway; TME-Trans-Manhattan Expressway.

* For HCS analyses, it is assumed that additional delays along the corridor are less than 2.5 minutes if speeds remain at 40 mph and above.

Vissim models were available at five study locations: Lincoln Tunnel, Holland Tunnel, Queens-Midtown Tunnel-Long Island Expressway corridor, the Hugh L. Carey Tunnel-Gowanus corridor, and Verrazzano-Narrows Bridge-Staten Island Expressway corridor. Two of the study locations, the Holland Tunnel and Lincoln Tunnel, were dropped from further analysis because the volume changes were found to be negative for all tolling scenarios and there would not be an increase in delay. The remaining three Vissim study

locations were analyzed in detail using an increase in delay of greater than or equal to 2.5 minutes as the primary criterion for determining adverse effects, although other factors such as speed, queue length, and density were also taken into consideration.

Three study locations were determined to be appropriate for the HCS model where speeds were 40 mph or higher: the RFK–Queens leg, the Bayonne Bridge, and the eastern spur of the New Jersey Turnpike. These locations were also evaluated using a greater than or equal to 2.5 minutes additional delay threshold as the primary criterion for the determination of adverse traffic effects along with other criteria such as LOS, speed, and density. (Note: If speeds remained greater than 40 mph under the CBD Tolling Alternative it was assumed that delays would be under 2.5 minutes for the entire corridor).

The remaining two study locations, the Trans-Manhattan/Cross Bronx Expressway and the FDR Drive between the Williamsburg Bridge and the Brooklyn Bridge, did not have an available Vissim model and the HCS was not an appropriate tool under congested conditions. Therefore, the analysis at these two locations defaulted to the SEQRA volume threshold of greater than 5 percent increase in traffic volumes under congested conditions (less than 20 mph) to determine adverse effects.

4B.4.2 Long Island Expressway (I-495) Leading to the Queens-Midtown Tunnel

The Queens-Midtown Tunnel connects the boroughs of Manhattan and Queens. The tunnel is designated as NY-495 and in Queens, leads directly to and from the Long Island Expressway (I-495) at the junction with the BQE (I-278), although the section from the Queens-Midtown Tunnel to Queens Boulevard in Queens is known as the Queens-Midtown Expressway, and the section between Queens Boulevard and the Queens-Nassau County line is known as the Horace Harding Expressway. The tunnel has two tubes, an inbound and outbound tube, each with two travel lanes. A contra-flow Bus/3+ HOV lane operates westbound in the morning from 6:00 a.m. to 10:00 a.m. from Van Dam Street to Queens-Midtown Tunnel and then along the south tube of the tunnel into Manhattan, providing three travel lanes to Manhattan during this time. Figure 4B-3 depicts the location of the highways leading to the Queens-Midtown Tunnel and highlights the extent of the microsimulation model area for the Queens-Midtown Expressway/I-495 analysis.

AFFECTED ENVIRONMENT

Consistent with other highway analyses for this Project, the highway segment analysis was performed using a Vissim model, which incorporated volume data from TBTA toll transaction data and was calibrated based on traffic counts and observed speeds using data provided by StreetLight Data, Inc. (a third-party, on-demand mobility analytics platform that provides past traffic information). Collectively, the TBTA transaction data and data provided by StreetLight Data, Inc. provided performance metrics including hourly volume, travel speed in miles per hour (mph). The data were used to calculate maximum queue length (in feet), density (in passenger cars per mile per lane), and overall LOS. For this microsimulation model, the maximum queue length is based on length of roadway occupied by vehicles not moving or moving below a speed of approximately 6 mph. Table 4B-4 presents a summary of the existing conditions during the weekday AM, MD, and PM peak hours.

Figure 4B-3. Highways Leading to the Queens-Midtown Tunnel

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Table 4B-4. Existing Conditions: Long Island Expressway (I-495): The Queens-Midtown Tunnel

PERFORMANCE (2019)	AM (8 a.m. to 9 a.m.)	MD (1 p.m. to 2 p.m.)	PM (5 p.m. to 6 p.m.)
Hourly Volume (vehicles)			
I-495 Inbound, Mainline	2,672	2,581	2,714
I-495 Inbound, High-Occupancy Vehicle (HOV)–AM only	940	—	—
Processed Hourly Volume (vehicles)*			
I-495 Inbound, Mainline	2,436	2,396	2,311
I-495 Inbound, HOV–AM only	940	—	—
Travel Time (min:sec)			
I-495 Inbound, Mainline	05:44	05:09	08:59
I-495 Inbound, HOV–AM only	01:19	—	—
Travel Speed (miles per hour)			
I-495 Inbound, Mainline	8.7	9.7	5.6
I-495 Inbound, HOV–AM only	40.8	—	—
Maximum Queue (feet)			
I-495 Inbound, Mainline	3,987	4,464	5,824
I-495 Inbound, HOV–AM only	2	—	—
Density (pc/mi/ln)			
I-495 Inbound, Mainline	78	72	133
I-495 Inbound, HOV–AM only	22	—	—
Level of Service (LOS)			
I-495 Inbound, Mainline	F	F	F
I-495 Inbound, HOV–AM only	C	—	—

Source: WSP, 2022.
* Processed volume is the volume actually handled by the Vissim model and is used for calibration purposes to make sure the model is set to actual traffic. For future conditions, the processed volume is a performance measure and unprocessed volumes create backups and longer queues.

Based on the October 2019, transaction data provided by TBTA, the highest average weekday hourly traffic volume of 3,612 vehicles (2,672 vehicles in the two inbound general-purpose lanes plus 940 vehicles in the contra-flow HOV lane) occurred along the Long Island Expressway (I-495) at the eastern portal of the Queens-Midtown Tunnel in the Manhattan-bound direction during the AM peak hour (8:00 a.m. to 9:00 a.m.).

Other hourly Manhattan-bound traffic volumes at the Queens-Midtown Tunnel include 2,581 vehicles and 2,714 vehicles during the MD peak hour (1:00 p.m. to 2:00 p.m.) and the PM peak hour (5:00 p.m. to 6:00 p.m.), respectively.

Travel speeds approaching the Queens-Midtown Tunnel depend upon the time of day. In the Manhattan-bound direction, speeds along the Long Island Expressway (I-495) at the eastern portal of the Queens-Midtown Tunnel during the AM peak hour averaged approximately 9 mph on the mainline lanes and approximately 41 mph on the contra-flow HOV lane, which operates only during the morning peak period. During the MD and PM peak hours, speeds in the Manhattan-bound direction on the mainline lanes were approximately 10 mph and 6 mph, respectively.

The maximum queue lengths along the Long Island Expressway (I-495) in the Manhattan-bound direction as measured east of the Queens-Midtown Tunnel portal in the microsimulation model, are approximately 3,987 feet, 4,464 feet, and 5,824 feet during the AM, MD, and PM peak hours, respectively.

The existing LOS varies from LOS C on the HOV lane during the AM peak hour to LOS F on the mainline lanes during all peak hours of a typical weekday day.

ENVIRONMENTAL CONSEQUENCES

Table 4B-5, Table 4B-6, and Table 4B-7 present the results of the Vissim analysis for the weekday AM, MD, and PM peak hours, respectively, for Tolling Scenario D, which is representative of the tolling scenarios, including Tolling Scenarios E and F. The assessment describes the incremental change between the No Action Alternative and the CBD Tolling Alternative.

The highway analysis of the Queens-Midtown Tunnel and its approaches indicated that under Tolling Scenario D, there would be relatively small increases in traffic during the AM and PM peak hours due to capacity constraints and a larger increase in traffic during the MD peak hour. The LOS at critical locations during the weekday AM, MD, and PM peak hours are projected to remain the same (at LOS F). The most notable change is expected to occur in the MD peak hour where travel speeds would potentially drop from about 11.8 to 6.0 mph and the travel times would potentially increase by about 4 minutes.

Under the SEQRA criteria the increase in traffic volumes would be within a 5 percent threshold during the AM peak hour with an increase of 125 vehicles. However, during the MD and PM peak hours, the increase in volume of 383 and 203 vehicles, respectively, would exceed a 5 percent threshold. However, the *[threshold of less than]* 2.5 minutes of additional delay is exceeded only during the MD peak hour.

AM Results (8:00 a.m. to 9:00 a.m.)

With CBD tolling, traffic in the Manhattan-bound direction is projected to increase by approximately 125 vehicles leading into the Queens-Midtown Tunnel. This would likely result in an increase in travel time during the AM peak of approximately 137 seconds in the mainline lanes, with the travel time in the HOV lane remaining the same as the No Action Alternative. Speeds are anticipated to decrease by 2.7 mph, from 9.1 mph to 6.4 mph, on the mainline lanes, while speeds on the HOV lane would remain the same as the No Action Alternative. Queues are expected to increase by approximately 1,719 feet (or approximately 86 vehicles) along the Long Island Expressway (I-495) mainline with no increase in the queue length expected for the HOV lane. The density along the Long Island Expressway (I-495) mainline lanes is expected to increase by approximately 39 pc/mi/ln and the LOS service would remain at LOS F. (The HOV lane would continue to operate at LOS C and the density is projected to remain the same as the No Action Alternative). Under the SEQRA criteria, the projected increase in traffic of 125 vehicles during the AM peak hour would be within a 5 percent increase and the additional delay of 2.2 minutes is less than the 2.5 minutes threshold; therefore, there would not be an adverse traffic effect during the AM peak hour.

MD Results (1:00 p.m. to 2:00 p.m.)

With CBD tolling, traffic volumes in the Manhattan-bound direction are projected to increase by approximately 383 vehicles on the mainline lanes. This is projected to result in an increase of approximately 242 seconds in travel time and speeds are projected to decrease by 5.8 mph, from 11.8 mph to 6.0 mph.

The maximum queue length is expected to increase by approximately 1,355 feet (or approximately 68 vehicles) along the Long Island Expressway (I-495) and the density is expected to increase approximately 76 pc/mi/ln. The LOS is expected to remain at LOS F. Under the SEQRA criteria, the projected increase in traffic of 383 vehicles during the MD peak hour would exceed 5 percent and the increased delay of 4.0 minutes would exceed the ***[delay threshold of less than]*** 2.5 minutes; therefore, there would be a potential adverse traffic effect during the MD peak hour.

Table 4B-5. Long Island Expressway (I-495) Approach to Queens-Midtown Tunnel – AM (8:00 a.m. to 9:00 a.m.)

PERFORMANCE (2023)	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume (vehicles)			
I-495 Inbound, Mainline	2,680	2,805	125
I-495 Inbound, High-Occupancy Vehicle (HOV) – AM only	940	940	0
Processed Hourly Volume (vehicles)*			
I-495 Inbound, Mainline	2,432	2,434	2
I-495 Inbound, HOV – AM only	942	943	1
Travel Time (min:sec)			
I-495 Inbound, Mainline	05:31	07:48	02:17
I-495 Inbound, HOV – AM only	01:19	01:19	00:00
Travel Speed (miles per hour)			
I-495 Inbound, Mainline	9.1	6.4	-2.7
I-495 Inbound, HOV – AM only	40.9	40.9	0.0
Maximum Queue (feet)			
I-495 Inbound, Mainline	3,981	5,700	1,719
I-495 Inbound, HOV – AM only	6	6	0
Density (pc/mi/ln)			
I-495 Inbound, Mainline	74	113	39
I-495 Inbound, HOV – AM only	23	23	0
Level of Service (LOS)			
I-495 Inbound, Mainline	F	F	—
I-495 Inbound, HOV – AM only	C	C	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.
* Processed volume is the volume actually handled by the Vissim model and is used for calibration purposes to make sure the model is set to actual traffic. For future conditions, the processed volume is a performance measure and unprocessed volumes create backups and longer queues.

Table 4B-6. Long Island Expressway (I-495) Approach to Queens-Midtown Tunnel – MD (1:00 p.m. to 2:00 p.m.)

PERFORMANCE (2023)	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume (vehicles)			
I-495 Inbound, Mainline	2,594	2,977	383
Processed Hourly Volume (vehicles)*			
I-495 Inbound, Mainline	2,444	2,490	46
Travel Time (min:sec)			
I-495 Inbound, Mainline	04:15	08:17	04:02
Travel Speed (miles per hour)			
I-495 Inbound, Mainline	11.8	6.0	-5.8
Maximum Queue (feet)			
I-495 Inbound, Mainline	3,505	4,860	1,355
Density (pc/mi/ln)			
I-495 Inbound, Mainline	55	131	76
Level of Service (LOS)			
I-495 Inbound, Mainline	F	F	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.
* Processed volume is the volume actually handled by the Vissim model and is used for calibration purposes to make sure the model is set to actual traffic. For future conditions, the processed volume is a performance measure and unprocessed volumes create backups and longer queues.

Table 4B-7. Long Island Expressway (I-495) Approach to Queens-Midtown Tunnel – PM (5:00 p.m. to 6:00 p.m.)

PERFORMANCE (2023)	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume (vehicles)			
I-495 Inbound, Mainline	2,687	2,890	203
Processed Hourly Volume (vehicles)*			
I-495 Inbound, Mainline	2,309	2,340	31
Travel Time (min:sec)			
I-495 Inbound, Mainline	08:27	09:45	01:18
Travel Speed (miles per hour)			
I-495 Inbound, Mainline	5.9	5.1	-0.8
Maximum Queue (feet)			
I-495 Inbound, Mainline	5,859	5,872	13**
Density (pc/mi/ln)			
I-495 Inbound, Mainline	127	141	14
Level of Service (LOS)			
I-495 (Inbound, Mainline)	F	F	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.
* Processed volume is the volume actually handled by the Vissim model and is used for calibration purposes to make sure the model is set to actual traffic. For future conditions, the processed volume is a performance measure and unprocessed volumes create backups and longer queues.
** Maximum queue length is constrained by the extent of the Vissim model. Actual increase in queue length is estimated at about 1,500 feet. This is based on an additional 203 vehicles accommodated in three lanes and 22-foot average vehicle spacing (15-foot average vehicle length and 7-foot average vehicle separation)

PM Results (5:00 p.m. to 6:00 p.m.)

With CBD tolling, Manhattan-bound direction traffic volumes are projected to increase by approximately 203 vehicles on the mainline lanes. This would likely result in an increase of approximately 78 seconds in travel time and speeds are anticipated to decrease slightly. Maximum queues are constrained by the extent of the Vissim model but are projected to increase by about 1,500 feet, assuming an additional 203 vehicles accommodated in three lanes and 22-foot vehicle spacing (15-foot average vehicle length and 7foot separation between vehicles). Queue delays are projected to increase, but these additional queue delays would likely occur east of Van Dam Street, which is outside of the model limits. Density is projected to increase by approximately 14 pc/mi/ln with the LOS remaining at LOS F. Under the SEQRA criteria, the projected increase in traffic of 203 vehicles during the PM peak hour would exceed the 5 percent ***[threshold]*** but the increase in delay would be 1.3 minutes which would be below the ***[delay threshold of]*** 2.5 minutes; therefore, there would not be an adverse traffic effect during the PM peak hour.

In summary, under Tolling Scenario D, traffic volumes would increase by 125/383/203 vehicles during the AM, MD, and PM peak hours, respectively, resulting in increased queue lengths and delays for all peak hours. Under the SEQRA criteria, assuming a potential adverse effect if traffic volumes increase more than 5 percent under congested conditions and delays increase by 2.5 minutes or more, there would be a potential adverse effect in the MD peak hour but no adverse effect during the AM and PM peak hours.

Adverse effects that would arise if Tolling Scenario D or another similar tolling scenario were implemented will be minimized through implementing Transportation Demand Management measures such as ramp metering, motorist information, signage, and/or targeted toll policy modifications to reduce diversions. The Project Sponsors will undertake monitoring of traffic patterns specifically tailored to the adopted tolling scenario—commencing prior to implementation with data collection approximately 3 months after the start of Project operations—to determine whether the predicted adverse effects are occurring and to determine the appropriate Transportation Demand Management measures (or improvement in existing Transportation Demand Management measures) to be implemented. The monitoring program will examine changes in traffic volumes, changes in speeds, and changes in delays along the affected highway corridors. Volume changes will be determined from before/after traffic counts (where available); speed changes will be determined from actual before/after speeds based on data provided by StreetLight Data, Inc.; and the change in delay along major highway corridors will be determined based on actual speeds based on data provided by StreetLight Data, Inc. The monitoring program will inform the development and implementation of appropriate Transportation Demand Management measures and *[subsequently]* possible adjustments to the tolling policy should traffic volumes increase by more than 5 percent and delays increase *[by]* 2.5 minutes *[or more]*.

4B.4.3 Gowanus Expressway Leading to I-278 Hugh L. Carey Tunnel

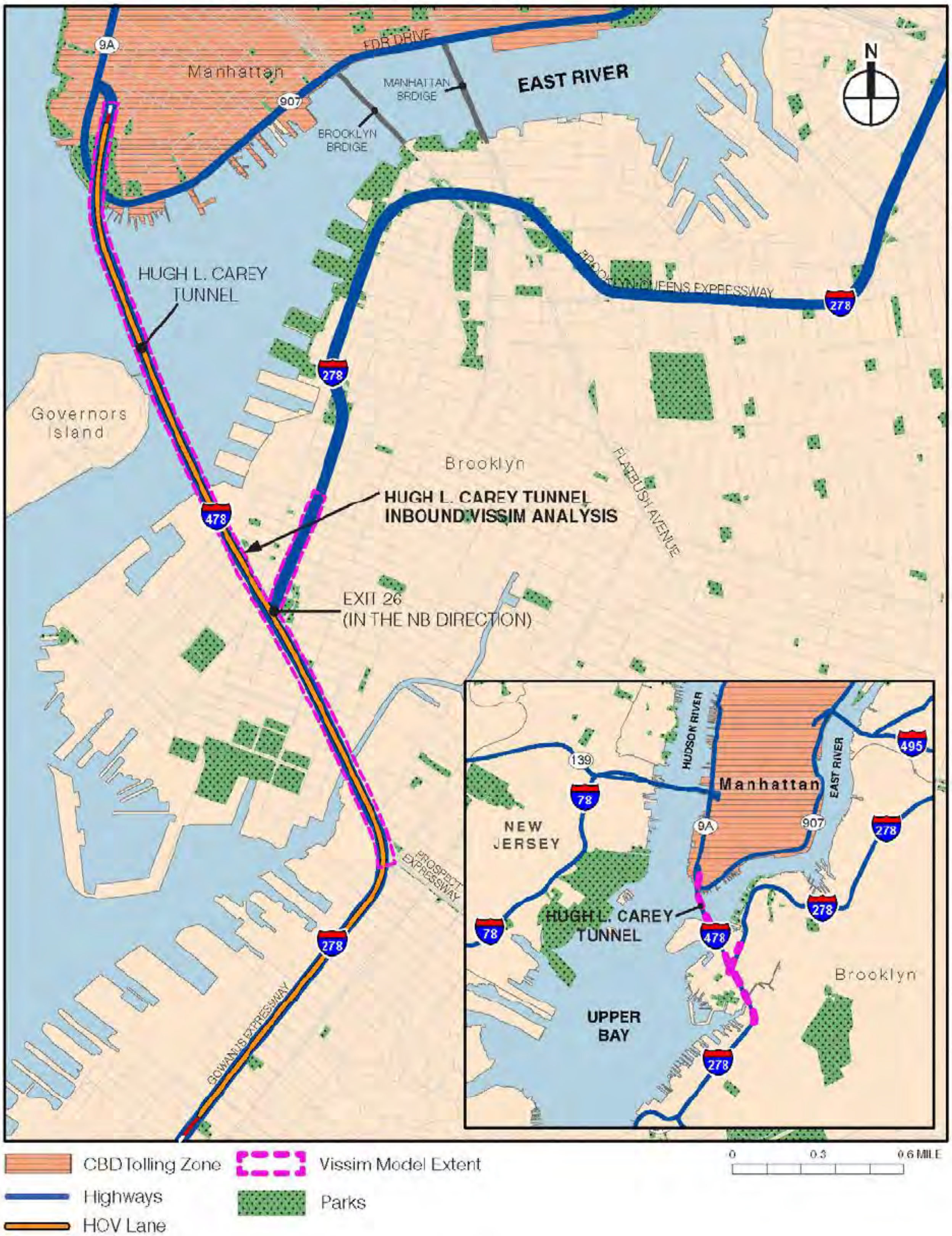
The Hugh L. Carey Tunnel consists of two tubes—each with two traffic lanes—one tube for each direction. The eastern tunnel portal is in the neighborhood of Red Hook in Brooklyn and the western portal is north of Battery Park in Lower Manhattan.

The Hugh L. Carey Tunnel is part of the Interstate Highway System, designated as I-478, and encompasses the length of the tunnel and the short highway connection to I-278. The I-278 designation is applied to several expressways, including the Gowanus Expressway in southern Brooklyn and BQE across northern Brooklyn and Queens. During the weekday AM peak period, an HOV lane operates along the eastbound Gowanus Expressway toward the Hugh L. Carey Tunnel, for a total of three lanes toward Manhattan. During the weekday PM peak period the HOV lane operates in the reverse direction, westbound, along the Gowanus Expressway, for a total of three lanes toward Brooklyn. At all other times, two travel lanes operate both east and west. Figure 4B-4 presents the location of the highways leading to and from the Hugh L. Carey Tunnel.

AFFECTED ENVIRONMENT

The highway segment analysis was performed using a Vissim model calibrated using existing speeds based on data provided by StreetLight Data, Inc. The model provides performance metrics including hourly processed volumes, travel time (in seconds), travel speed (in miles per hour), maximum queue length (in feet), density (in passenger cars per mile per lane), and overall LOS. Table 4B-8 presents a summary of existing conditions during the weekday AM, MD, and PM peak hours.

Figure 4B-4. Highways Leading to the Hugh L. Carey Tunnel



Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Table 4B-8. Existing Conditions: Gowanus Expressway Leading to Hugh L. Carey Tunnel

PERFORMANCE (2019)	AM (8 a.m. to 9 a.m.)	MD (1 p.m. to 2 p.m.)	PM (5 p.m. to 6 p.m.)
Hourly Volume			
Total Volume to Hugh L. Carey Tunnel	2,953	1,551	1,205
Total Volume to Brooklyn-Queens Expressway (BQE)	1,308	2,528	2,964
Total Volume Weaving Segment	2,453	3,615	3,759
Travel Time (min:sec)			
Gowanus to BQE Off-Ramp, Weaving Segment	03:53	03:43	04:54
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	02:04	01:37	01:35
High-Occupancy Vehicle Lane	02:56	—	—
Travel Speed (miles per hour)			
Gowanus to BQE Off-Ramp, Weaving Segment	11.6	12.5	9.8
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	13.8	17.8	18.0
High-Occupancy Vehicle Lane	17.0	—	—
Maximum Queue (feet)			
Gowanus to BQE Off-Ramp, Weaving Segment	6,555	4,687	7,006
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	1,756	158	294
High-Occupancy Vehicle Lane	0	—	—
Density (pc/mi/ln)			
Gowanus to BQE Off-Ramp, Weaving Segment	77	87	93
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	34	25	15
High-Occupancy Vehicle Lane	56	—	—
Level of Service (LOS)			
Gowanus to BQE Off-Ramp, Weaving Segment	F	F	F
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	D	C	B
High-Occupancy Vehicle Lane	F	—	—

Source: WSP, 2022.

The highest average weekday hourly traffic volume of 2,953 vehicles, based upon October 2019 data provided by TBTA, occurs in the Manhattan-bound direction during the AM peak hour (8:00 a.m. to 9:00 a.m.). Other hourly Manhattan-bound traffic volumes at the Hugh L. Carey Tunnel are 1,551 vehicles and 1,205 vehicles in the MD peak hour (1:00 p.m. to 2:00 p.m.) and PM peak hour (5:00 p.m. to 6:00 p.m.), respectively.

The speeds in the Hugh L. Carey Tunnel vary by the time of day. In the Manhattan-bound direction the slowest speeds along I-478 at the eastern portal of the Hugh L. Carey Tunnel are during the AM peak hour, averaging 13.8 mph. During the MD and PM peak hours, speeds in the Manhattan-bound direction on the same segment are 17.8 mph and 18.0 mph, respectively. The average Manhattan-bound speeds along the most critical segment—the I-478 weaving segment between the merge of the Gowanus Expressway with the Prospect Expressway, over Hamilton Avenue, to the exit ramp to the BQE and Hamilton Avenue (Exit 26)—are 11.6 mph, 12.5 mph, and 9.8 mph during the AM, MD, and PM peak hours, respectively. In

the HOV lane, which operates in the Manhattan-bound direction during the AM peak period, vehicles move at an average speed of 17 mph.

The maximum queue lengths along I-478 as measured east from the Hugh L. Carey Tunnel portal segment after the exit ramp to the BQE (Exit 26 to Hamilton Avenue access to the Hugh L. Carey Tunnel entrance) are approximately 1,756 feet, 158 feet, and 294 feet during the AM, MD, and PM peak hours, respectively. The maximum queue lengths along I-478 measured on the weaving segment between the merge from Gowanus/Prospect Expressways and the exit ramp to the BQE are approximately 6,555 feet, 4,687 feet, and 7,006 feet during the AM, MD, and PM peak hours, respectively.

Three locations on the Manhattan-bound tunnel approach show the existing LOS varies from LOS B to LOS F. The I-478 weaving section before the exit ramp to the BQE on the approach to the Hugh L. Carey Tunnel operates at LOS F during the AM, MD, and PM peak hours. The section along the I-478 segment between the exit ramp to the BQE and the eastern portal of the Hugh L. Carey Tunnel operates at LOS D, LOS C, and LOS B during the AM, MD, and PM peak hours, respectively. The HOV lane operates at LOS F at about 17 miles per hour without queues.

ENVIRONMENTAL CONSEQUENCES

For the 2023 No Action Alternative and 2023 CBD Tolling Alternative (Tolling Scenario D), Table 4B-9, Table 4B-10, and Table 4B-11 present results of the Vissim assessment for the weekday AM, MD, and PM peak hours, respectively. The assessment summarized below describes the incremental change between the No Action Alternative and CBD Tolling Alternative.

Overall, the highway analysis of the Hugh L. Carey Tunnel and its approaches indicates that under Tolling Scenario D, there would likely be a change in travel patterns and an increase in traffic that would result in increased travel times, higher densities, and deteriorating LOS, thereby creating potential adverse traffic effects under the SEQRA criteria.

The change in traffic patterns resulting from the CBD Tolling Alternative is expected to result in a shift of traffic from the BQE to the Hugh L. Carey Tunnel in the critical weaving section between the merge of the Gowanus and Prospect Expressways and the Hugh L. Carey Tunnel split from the BQE based on the route choice of the tunnel versus other East River crossings. The anticipated decrease in volume on the BQE would improve its operation while the increase in volume to the Hugh L. Carey Tunnel would be expected to result in increased delays at the tunnel approach. The change in traffic volumes during the AM and PM peak hours are expected to be small due to capacity constraints at the Hugh L. Carey Tunnel while larger changes in volumes are expected during the MD peak hour. Table 4B-9, Table 4B-10, and Table 4B-11 provide a summary of the results by peak hour.

Table 4B-9. Hugh L. Carey Tunnel – AM (8:00 a.m. to 9:00 a.m.)

PERFORMANCE (2023)	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume (vehicles)			
Total Volume to Hugh L. Carey Tunnel	3,233	3,305	72
Total Volume to Brooklyn-Queens Expressway (BQE)	1,147	1,105	-42
Total Volume Weaving Segment	2,453	2,453	0
Processed Hourly Volume (vehicles)			
Total Volume to Hugh L. Carey Tunnel	3,521	3,506	-15
Total Volume to BQE	1,294	1,212	-82
Total Volume Weaving Segment	2,821	2,780	-41
Travel Time (min:sec)			
Gowanus to BQE Off-Ramp, Weaving Segment	02:49	04:02	01:13
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	03:10	03:19	00:09
High-Occupancy Vehicle Lane	02:56	02:56	00:00
Travel Speed (miles per hour)			
Gowanus to BQE Off-Ramp, Weaving Segment	15.5	11.2	-4.3
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	9.1	8.7	-0.4
High-Occupancy Vehicle Lane	16.9	16.9	0.0
Maximum Queue (feet)			
Gowanus to BQE Off-Ramp, Weaving Segment	3,691	5,315	1,624
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	2,361	2,377	16
High-Occupancy Vehicle Lane	0	0	—
Density (pc/mi/ln)			
Gowanus to BQE Off-Ramp, Weaving Segment	53	81	28
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	69	78	9
High-Occupancy Vehicle Lane	60	61	1
Level of Service (LOS)			
Gowanus to BQE Off-Ramp, Weaving Segment	F	F	—
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	F	F	—
High-Occupancy Vehicle Lane	F	F	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.

Table 4B-10. Hugh L. Carey Tunnel – MD (1:00 p.m. to 2:00 p.m.)

PERFORMANCE MEASURES	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume			
Total Volume to Hugh L. Carey Tunnel	1,867	2,353	486
Total Volume to Brooklyn-Queens Expressway (BQE)	2,248	1,820	-428
Total Volume Weaving Segment	3,615	3,615	0
Processed Hourly Volume			
Total Volume to Hugh L. Carey Tunnel	1,858	2,348	490
Total Volume to BQE	2,320	1,882	-438
Total Volume Weaving Segment	3,639	3,636	-3
Travel Time (min:sec)			
Gowanus to BQE Off-Ramp, Weaving Segment	02:15	02:12	-00:03
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	01:39	01:43	00:04
Travel Speed (miles per hour)			
Gowanus to BQE Off-Ramp, Weaving Segment	19.3	19.8	0.5
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	17.4	16.7	-0.7
Maximum Queue (feet)			
Gowanus to BQE Off-Ramp, Weaving Segment	1,277	201	-1,076
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	374	772	398
Density (pc/mi/ln)			
Gowanus to BQE Off-Ramp, Weaving Segment	47	45	-2
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	33	44	11
Level of Service (LOS)			
Gowanus to BQE Off-Ramp, Weaving Segment	F	E	—
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	D	E	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.

Table 4B-11. Hugh L. Carey Tunnel – PM (5:00 p.m. to 6:00 p.m.)

PERFORMANCE MEASURES	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume			
Total Volume to Hugh L. Carey Tunnel	1,302	1,349	47
Total Volume to Brooklyn-Queens Expressway (BQE)	2,877	2,834	-43
Total Volume Weaving Segment	3,759	3,759	0
Processed Hourly Volume			
Total Volume to Hugh L. Carey Tunnel	1,303	1,374	71
Total Volume to BQE	2,852	2,889	37
Total Volume Weaving Segment	3,722	3,815	93
Travel Time (min:sec)			
Gowanus to BQE Off-Ramp, Weaving Segment	03:56	03:07	-00:49
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	01:38	01:41	00:03
Travel Speed (miles per hour)			
Gowanus to BQE Off-Ramp, Weaving Segment	12.4	15.2	2.8
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	17.6	17.1	-0.5
Maximum Queue (feet)			
Gowanus to BQE Off-Ramp, Weaving Segment	4,509	2,828	-1,681
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	423	631	208
Density (pc/mi/ln)			
Gowanus to BQE Off-Ramp, Weaving Segment	84	71	-13
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	18	20	2
Level of Service (LOS)			
Gowanus to BQE Off-Ramp, Weaving Segment	F	F	—
Mainline to Hugh L. Carey Tunnel After Exit 26 (BQE)	C	C	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.

AM Results (8:00 a.m. to 9:00 a.m.)

Under Tolling Scenario D, traffic volumes to the Hugh L. Carey Tunnel are projected to increase by approximately 72 vehicles while traffic volumes to the BQE are expected to decrease by about 42 vehicles. Traffic volumes in the critical weaving segment between the merge of the Gowanus Expressway and Prospect Expressway to the split to the BQE and the Hugh L. Carey Tunnel are expected to remain about the same. Approximately 42 vehicles would be diverted from the BQE and instead would stay on the main travel way to the Manhattan-bound Hugh L. Carey Tunnel.

This would result in an estimated 73-second increase in travel time in the weaving segment between the merge of the Gowanus/Prospect Expressway and the off-ramp to the BQE. There would be an increase in travel time of approximately 9 seconds between the BQE off-ramp and the eastern portal of the Hugh L. Carey Tunnel due to increased volumes proceeding directly to the tunnel. The travel time in the HOV lane would remain approximately the same. At the eastern portal of the Hugh L. Carey Tunnel, speeds would decrease by about 0.4 mph, while speeds would decrease in the weaving section of the approach between the Gowanus/Prospect Expressway merge and the exit ramp to the BQE by about 4.3 mph.

While total volumes in the weaving segment would be about the same, heavier weaving volumes, from the Prospect Expressway, would result in additional queues in the segment between the Gowanus and Prospect merge and the split to the Hugh L. Carey Tunnel and BQE exit ramp. Under the CBD Tolling Alternative, the queues are anticipated to increase in the weaving segment before the exit ramp to the BQE by about 1,624 feet (or approximately 82 passenger cars) and there would be no queues anticipated along the HOV lane. An increase in density of 28 pc/ln/mi is anticipated for the weave segment. The LOS would remain the same under the CBD Tolling Alternative as the No Action Alternative at LOS F along the general-purpose lanes.

Under SEQRA, the increase in volume would be within 5 percent and the increase in delay of 1.2 minute in the weaving segment would be below 2.5 minutes; therefore, there would not be an adverse traffic effect during the AM peak hour.

MD Results (1:00 p.m. to 2:00 p.m.)

With CBD tolling, traffic volumes in the Hugh L. Carey Tunnel are projected to increase by 486 vehicles and traffic to the BQE is expected to decrease by about 428 vehicles, while total traffic volume on the I-478 weaving segment between the merge of Gowanus/Prospect Expressway and the exit ramp to the BQE would remain about the same.

Travel time in the weaving segment between the merge of Gowanus/Prospect Expressway and the exit ramp to the BQE as well as the approach to the Hugh L. Carey Tunnel would be expected to remain about the same. Overall, at the eastern portal of the Hugh L. Carey Tunnel, speeds would decrease by about 0.7 mph, while there would be improvement in speeds on the weaving section of the approach between the Gowanus/Prospect Expressway merge and BQE off-ramp by about 0.5 mph. Additional queue delays are anticipated and maximum queue lengths on this segment are expected to increase by approximately 398 feet (or approximately 20 vehicles). Reduction in queuing is anticipated in the weaving segment before the exit ramp to the BQE under the CBD Tolling Alternative by about 1,076 feet (or approximately

54 vehicles). Density along the Hugh L. Carey Tunnel approach is expected to increase by 11 pc/mi/ln, and as a result LOS would deteriorate from LOS D to LOS E. A reduction in density is anticipated by 2 pc/mi/ln in the weaving segment before the exit ramp to the BQE and the LOS is projected to improve from LOS F to LOS E.

Under the SEQRA criteria used for the initial evaluation of potential adverse effects, traffic volumes to the Hugh L. Carey Tunnel would increase more than 5 percent, but the detailed Vissim analysis indicates there is sufficient capacity in the tunnel to handle the additional traffic and there would be a minimal increase in delay of a few seconds which would be well below the 2.5 minutes threshold;[19] therefore, there would not be an adverse traffic effect during the MD peak hour.

PM Results (5:00 p.m. to 6:00 p.m.)

With CBD tolling, traffic volumes in the Hugh L. Carey Tunnel are projected to increase by 47 vehicles. The total traffic volume for the critical I-478 weaving segment between the merge of Gowanus/Prospect Expressway and the off-ramp to the BQE would remain about the same. Under the CBD Tolling Alternative, approximately 43 vehicles would no longer use the BQE and would instead shift to the Manhattan-bound Hugh L. Carey Tunnel.

This would result in an estimated 49-second reduction in travel time in the weaving segment between the merge of Gowanus/Prospect Expressway and the off-ramp to the BQE. There is a small, anticipated increase of 3 seconds in travel time between the BQE exit ramp and the eastern portal of the Hugh L. Carey Tunnel. Overall, at the eastern portal of the Hugh L. Carey Tunnel, speeds would decrease by 0.5 mph, while there would be improvement in speeds on the weaving section of the approach between the Gowanus/Prospect Expressway merge and BQE exit ramp by 2.8 mph. Additional queue delays are anticipated and maximum queue lengths at the eastern portal of the Hugh L. Carey Tunnel are expected to increase by approximately 208 feet (or approximately 10 vehicles). Reduction in queuing is anticipated in the weaving segment before the exit ramp to the BQE under the CBD Tolling Alternative by 1,681 feet (or approximately 84 vehicles). At the eastern portal of the Hugh L. Carey Tunnel, density is expected to increase by 2 pc/mi/ln. A reduction in density is anticipated of 13 pc/mi/ln in the weaving segment before the exit ramp to the BQE. The LOS is projected to remain the same under the CBD Tolling Alternative as it would in the No Action Alternative for all segments. The increase in traffic would not exceed 5 percent and there would be a reduction in delays of 49 seconds in the weaving segment; therefore, there would not be an adverse effect during the PM peak hour.

In summary, under Tolling Scenario D, inbound traffic volumes to the Hugh L. Carey Tunnel would increase by 72/486/47 vehicles during the AM, MD, and PM peak hours, respectively, resulting in increased queue lengths and delays for some time periods. Under the SEQRA criteria, assuming an increase in volume within 5 percent under congested conditions would not be considered an adverse effect, there would not be an adverse effect during the AM and PM peak hours. During the MD peak hour, although the 5 percent threshold would be exceeded, further detailed analysis indicates that there would be sufficient capacity in

[19] The capacity of the two inbound lanes is approximately 2,600 vehicles per hour. The projected CBD Tolling Alternative volume under the tolling scenario analyzed would be about 2,353 vehicles, which would be below capacity.

the two inbound lanes to handle the additional traffic volumes and delays would be well below the 2.5-minute threshold; therefore, there would not be an adverse effect during the MD peak hour.

4B.4.4 Staten Island Expressway Leading to the Verrazzano-Narrows Bridge

The Verrazzano-Narrows Bridge is a major regional highway link between Staten Island and Brooklyn, providing connections to the Staten Island Expressway and the Gowanus Expressway (Figure 4B-5).

As established by the BPM modeling results of the total trips currently using the bridge in the eastbound direction, only 7 percent are destined to the Manhattan CBD and would be directly affected by the Project.

In the westbound direction, some CBD through trips destined to New Jersey and points beyond are expected to divert to the Verrazzano-Narrows Bridge in order to avoid the CBD toll, resulting in higher westbound traffic volumes.

Based upon the BPM results, there would either be a decrease or a marginal increase in traffic, depending on the peak period, in the eastbound (Brooklyn-bound) direction on the Verrazzano-Narrows Bridge. Therefore, this highway analysis examined only the westbound (Staten Island-bound) direction where potential additional delays and queues would occur along the Staten Island Expressway between the Verrazzano-Narrows Bridge and Hylan Boulevard due to a projected increase in traffic.

Because the Verrazzano-Narrows Bridge would experience an increase in traffic only in the westbound (Staten Island-bound) direction based on traffic projected to navigate around the Manhattan CBD, this highway analysis examined only the westbound direction where potential additional delays and queues would occur along the Staten Island Expressway between the Verrazzano-Narrows Bridge and Hylan Boulevard due to a projected increase in traffic.

AFFECTED ENVIRONMENT

The highway analyses were performed using a calibrated Vissim model specifically modified for the Project along highways that would be expected to experience an increase in traffic and slower speeds.[20] Table 4B-12 presents a summary of existing conditions during the weekday AM, MD, and PM peak hours.

Based upon October 2019 weekday transaction data provided by TBTA, the heaviest westbound traffic volume occurs during the PM peak hour, with a total of 8,521 vehicles. Traffic volumes during the AM and MD peak hours are lower at 5,789 and 5,425 vehicles, respectively. Typically, the average speeds in the calibrated Vissim model in the westbound direction along the Staten Island Expressway (I278) between the Verrazzano-Narrows Bridge and Hylan Boulevard vary in the range of 18.4 to 29.3 mph during the AM peak hour and 27.0 to 46.7 mph during the MD peak hour. During the PM peak hour, speeds were observed to decrease to the range of 16.8 to 23.7 mph, indicating relatively congested travel conditions during that period.

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20 The model was calibrated using existing speeds provided by StreetLight Data, Inc., hourly traffic counts, and observed queue lengths. Performance measures include processed volumes, speeds, maximum queue length (in feet), density (in passenger cars per mile per lane), and overall LOS.

Figure 4B-5. Highways Leading to/from the Verrazzano-Narrows Bridge

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Table 4B-12. Existing Conditions: Staten Island Expressway (I-278) Westbound – Verrazzano-Narrows Bridge to Hylan Boulevard

PERFORMANCE (2019)	AM (7 a.m. to 8 a.m.)	MD (1 p.m. to 2 p.m.)	PM (4 p.m. to 5 p.m.)
Hourly Volume			
Staten Island Expressway (SIE) Westbound (WB) Upper Level (UL)	2,153	2,656	4,281
SIE WB Lower Level (LL)	2,435	2,445	3,775
SIE WB – High-Occupancy Vehicle UL	1,201	324	465
Travel Time (min:sec)			
Verrazzano-Narrows Bridge merge to Lily Pond WB LL	01:12	00:34	01:03
To Lily Pond WB UL	00:59	00:55	00:56
Lily Pond to Hylan Boulevard WB LL	01:16	00:48	02:05
Lily Pond to Hylan Boulevard WB UL	01:17	00:50	02:14
SIE WB LL to Hylan Boulevard	02:28	01:20	03:10
SIE WB UL to Hylan Boulevard	02:06	01:42	03:06
Travel Speed (miles per hour)			
To Lily Pond WB LL	18.4	38.9	20.4
To Lily Pond WB UL	24.9	27.0	23.7
Lily Pond to Hylan Boulevard WB LL	29.2	46.7	17.3
Lily Pond to Hylan Boulevard WB UL	29.3	45.5	16.8
SIE WB LL to Hylan Boulevard	23.8	44.1	18.3
SIE WB UL to Hylan Boulevard	28.8	35.3	19.1
Density (pc/mi/ln)			
To Lily Pond WB LL	21	13	39
To Lily Pond WB UL	16	22	36
SIE WB LL to Hylan Boulevard	21	14	44
SIE WB UL to Hylan Boulevard	18	13	61
Level of Service (LOS)			
To Lily Pond WB LL	C	B	E
To Lily Pond WB UL	B	C	E
SIE WB LL to Hylan Boulevard	C	B	F
SIE WB UL to Hylan Boulevard	B	B	F

Source: WSP, 2022.

Travel times vary depending on whether the upper or lower level of the bridge is used. Based upon observed travel time data, it took slightly longer for westbound lower-level users to cross the bridge to Hylan Boulevard along the Staten Island Expressway (I-278) during the AM and PM peak hours, when the traffic volumes were higher. Travel times between the Verrazzano-Narrows Bridge and Hylan Boulevard in the calibrated Vissim model were approximately 148 seconds and 190 seconds for the lower-level users during the AM and PM peak, respectively. For those using the upper level, travel times were 126 seconds and 186 seconds during the AM and PM peak, respectively.

The most congested analyzed segment of the westbound Staten Island Expressway (I-278) was between Lily Pond Road and Hylan Boulevard during the PM peak hour, with the lowest observed speeds of approximately 17.3 and 16.8 mph for the lower and upper levels, respectively.

There were no queues observed along the westbound Staten Island Expressway (I-278) between the Verrazzano-Narrows Bridge and Hylan Boulevard throughout all peak hours of the day. The existing LOS on westbound Staten Island Expressway (I-278) between the Verrazzano-Narrows Bridge and Hylan Boulevard is LOS C or better during the AM and MD peak hours, and LOS E and LOS F during the PM peak hour.[21]

ENVIRONMENTAL CONSEQUENCES

Table 4B-13, Table 4B-14, and Table 4B-15 present the Vissim results for the weekday AM, MD, and PM peak hours, respectively for the 2023 No Action and the 2023 CBD Tolling Alternative for Tolling Scenario D, which represents the tolling scenario with the highest increase in traffic.

In summary, the additional traffic volumes on the westbound Staten Island Expressway (I-278) are relatively small during the AM and PM peak hours, and there is sufficient capacity to handle the additional volumes expected under Tolling Scenario D and is not anticipated to result in an adverse effect to highway operations for the AM, MD, and PM peak hours. The relatively small volume changes resulted in insignificant changes across several roadway performance metrics, and thus not all metrics are presented in the table; therefore, there would not be adverse traffic effects for any of the tolling scenarios being considered nor any other tolling scenario adopted that would have lower tolls.

The results for each peak hour are described below.

AM Results (7:00 a.m. to 8:00 a.m.)

With CBD tolling, there would likely be a small increase in traffic during the AM peak hour in the westbound direction on the Verrazzano-Narrows Bridge, with an additional 32 vehicles on the upper level and an additional 64 vehicles on the lower level. Traffic in the HOV lane would likely remain the same. Under the CBD Tolling Alternative, the average speeds along the Staten Island Expressway (I-278) westbound between the Verrazzano-Narrows Bridge and Hylan Boulevard would likely remain in the range of 17.2 to 29.2 mph. There would be no queues between the Verrazzano-Narrows Bridge and Hylan Boulevard resulting from the implementation of the Project, and the LOS would remain the same at LOS C or better. The increase in volume would be small and within a 5 percent increase and the increase in delay of less than 10 seconds would be well below 2.5 minutes; therefore, there would not be an adverse effect during the AM peak hour.

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21 Two-way (split) tolling was implemented at the Verrazzano-Narrows Bridge on December 1, 2020. The BPM modeling and the Vissim analyses incorporated the change in toll collection to two-way tolling.

Table 4B-13. Staten Island Expressway (I-278) Westbound—Verrazzano-Narrows Bridge to Hylan Boulevard – AM (7:00 a.m. to 8:00 a.m.)

PERFORMANCE MEASURES	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume			
Staten Island Expressway (SIE) Westbound (WB) Upper Level (UL)	2,196	2,228	32
SIE WB Lower Level (LL)	2,484	2,548	64
SIE WB – High-Occupancy Vehicle (HOV) UL	1,225	1,225	0
Travel Time (min:sec)			
To Lily Pond WB LL	01:12	01:17	00:05
To Lily Pond WB UL	00:59	01:00	00:01
Lily Pond to Hylan Boulevard WB LL	01:16	01:17	00:01
Lily Pond to Hylan Boulevard WB UL	01:17	01:17	00:00
SIE WB LL to Hylan Boulevard	02:28	02:30	00:02
SIE WB UL to Hylan Boulevard	02:06	02:06	00:00
Travel Speed (miles per hour)			
To Lily Pond WB LL	17.4	17.2	-0.2
To Lily Pond WB UL	24.9	24.8	-0.1
Lily Pond to Hylan Boulevard WB LL	29.1	29.0	-0.1
Lily Pond to Hylan Boulevard WB UL	29.4	29.2	-0.2
SIE WB LL to Hylan Boulevard	23.5	23.5	0.0
SIE WB UL to Hylan Boulevard	28.8	28.7	-0.1
Density (pc/mi/ln)			
To Lily Pond WB LL	23.8	27.0	3.2
To Lily Pond WB UL	16.5	17.4	0.9
SIE WB LL to Hylan Boulevard	21.5	22.8	1.3
SIE WB UL to Hylan Boulevard	18.7	19.7	1.0
Level of Service (LOS)			
To Lily Pond WB LL	C	C	—
To Lily Pond WB UL	B	B	—
SIE WB LL to Hylan Boulevard	C	C	—
SIE WB UL to Hylan Boulevard	B	B	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.

Table 4B-14. Staten Island Expressway (I-278) Westbound—Verrazzano-Narrows Bridge to Hylan Boulevard – MD (1:00 p.m. to 2:00 p.m.)

PERFORMANCE MEASURES	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume			
Staten Island Expressway (SIE) Westbound (WB) Upper Level (UL)	2,738	2,939	201
SIE WB Lower Level (LL)	2,533	2,789	256
SIE WB – HOV UL	330	330	0
Travel Time (min:sec)			
To Lily Pond WB LL	00:33	00:34	00:01
To Lily Pond WB UL	00:55	00:55	00:00
Lily Pond to Hylan Boulevard WB LL	00:48	00:48	00:00
Lily Pond to Hylan Boulevard WB UL	00:49	00:50	00:01
SIE WB LL to Hylan Boulevard	01:20	01:20	00:00
SIE WB UL to Hylan Boulevard	01:42	01:43	00:01
Travel Speed (miles per hour)			
To Lily Pond WB LL	40.0	38.7	-1.3
To Lily Pond WB UL	27.0	26.8	-0.2
Lily Pond to Hylan Boulevard WB LL	46.8	46.7	-0.1
Lily Pond to Hylan Boulevard WB UL	45.6	45.4	-0.2
SIE WB LL to Hylan Boulevard	44.1	43.9	-0.2
SIE WB UL to Hylan Boulevard	35.4	35.2	-0.2
Density (pc/mi/ln)			
To Lily Pond WB LL	11	14	3
To Lily Pond WB UL	22	24	2
SIE WB LL to Hylan Boulevard	14	15	1
SIE WB UL to Hylan Boulevard	13	14	1
Level of Service (LOS)			
To Lily Pond WB LL	B	B	—
To Lily Pond WB UL	C	C	—
SIE WB LL to Hylan Boulevard	B	B	—
SIE WB UL to Hylan Boulevard	B	B	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.

Table 4B-15. Staten Island Expressway (I-278) Westbound—Verrazzano-Narrows Bridge to Hylan Boulevard – PM (4:00p.m. to 5:00p.m.)

PERFORMANCE MEASURES	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume			
Staten Island Expressway (SIE) Westbound (WB) Upper Level (UL)	4,367	4,442	75
SIE WB Lower Level (LL)	3,850	3,947	97
SIE WB – High-Occupancy Vehicle (HOV) UL	474	474	0
Travel Time (min:sec)			
To Lily Pond WB LL	01:04	01:04	00:00
To Lily Pond WB UL	00:58	00:59	00:01
Lily Pond to Hylan Boulevard WB LL	02:04	02:08	00:04
Lily Pond to Hylan Boulevard WB UL	02:09	02:15	00:06
SIE WB LL to Hylan Boulevard	03:11	03:14	00:03
SIE WB UL to Hylan Boulevard	03:04	03:10	00:06
Travel Speed (miles per hour)			
To Lily Pond WB LL	20.3	20.3	0.0
To Lily Pond WB UL	22.7	22.3	-0.4
Lily Pond to Hylan Boulevard WB LL	17.5	16.9	-0.6
Lily Pond to Hylan Boulevard WB UL	17.5	16.8	-0.7
SIE WB LL to Hylan Boulevard	18.2	17.9	-0.3
SIE WB UL to Hylan Boulevard	19.3	18.7	-0.6
Density (pc/mi/ln)			
To Lily Pond WB LL	37.4	37.7	0.3
To Lily Pond WB UL	37.0	37.7	0.7
SIE WB LL to Hylan Boulevard	42.5	43.5	1.0
SIE WB UL to Hylan Boulevard	59.5	61.6	2.1
Level of Service (LOS)			
To Lily Pond WB LL	E	E	—
To Lily Pond WB UL	E	E	—
SIE WB LL to Hylan Boulevard	F	F	—
SIE WB UL to Hylan Boulevard	F	F	—

Source: WSP, 2022.
Note: Tolling Scenarios E and F results are expected to be similar to Tolling Scenario D.

MD Results (1:00 p.m. to 2:00 p.m.)

Under Tolling Scenario D, an increase in traffic is projected during the MD peak hour in the westbound direction on the Verrazzano-Narrows Bridge with an additional 201 vehicles on the upper level and an additional 256 vehicles on the lower level. Traffic in the HOV lane would likely remain the same. There would be a small reduction in speeds using the lower level or upper level of the Verrazzano-Narrows Bridge, but the change in speeds would not be noticeable. Although the projected increase in traffic volume would be nominally above normal daily fluctuation and would exceed 5 percent there would be sufficient capacity to absorb the additional traffic, with additional delays of less than 10 seconds and the LOS would remain

the same at C or better; therefore, since the increase in delay would be well below the 2.5-minute threshold there would not be an adverse traffic effect under the SEQRA criteria.

PM Results (4:00 p.m. to 5:00 p.m.)

With CBD tolling, an increase in traffic is projected during the PM peak hour in the westbound direction on the Verrazzano-Narrows Bridge, with an additional 75 vehicles on the upper level and 97 vehicles on the lower level. Traffic levels in the HOV lane would remain the same. The average speeds along the Staten Island Expressway (I-278) westbound between the Verrazzano-Narrows Bridge and Hylan Boulevard would remain approximately the same as the No Action Alternative, in the range of 16.8 to 22.3 mph. There would be no increase in queues between the Verrazzano-Narrows Bridge and Hylan Boulevard and densities would be similar. Overall, there would be no change in LOS and increase in delays would be well below the 2.5-minute threshold; therefore, there would be no adverse effects associated with the additional volume during the PM peak hour.

Under Tolling Scenario D, a small increase in traffic is projected during the PM peak hour in the westbound direction on the Verrazzano-Narrows Bridge with an additional 75 vehicles on the upper level and an additional 97 vehicles on the lower level. Traffic in the HOV lane would remain the same. Average speeds under the No Action Alternative range from 16.8 to 22.3 mph. There would be a small reduction in speeds using the lower level or upper level of the Verrazzano-Narrows Bridge, but the change in speeds would be small and not noticeable. The projected increase in traffic volume is small and within 5 percent and the increase in delay would be less than 10 seconds which would be well below the 2.5-minute threshold; therefore, there would not be an adverse traffic effect during the PM peak hour.

In summary, Tolling Scenario D would result in increases in traffic volumes westbound on the Verrazzano-Narrows Bridge during the AM, MD, and PM peak hours of 32/201/75 vehicles at the lower level and 64/256/97 vehicles at the upper level, respectively. These increases in traffic volumes are relatively small and would not have an appreciable effect on travel times, delays, speeds, and densities. The LOS would remain the same during all time periods for all highway segments operating at LOS B/C during the AM and MD peak hours and LOS E/F during the PM peak hour. The increase in delay would be under 10 seconds for all time periods which would be well under the 2.5-minute threshold; therefore, Tolling Scenario D (and Tolling Scenarios E and F), would have no adverse traffic effect along the Verrazzano-Narrows Bridge and the Staten Island Expressway during any time period under the SEQRA criteria. Tolling Scenarios A, B, C, and G, with Lower Manhattan CBD tolls, would be expected to create less diversions than the tolling scenarios with the largest increase in traffic; therefore, these tolling scenarios would also not result in adverse traffic effects.

4B.4.5 I-78 and Route 139 Approach to the Holland Tunnel

The Holland Tunnel is a major gateway between New Jersey and Lower Manhattan with access from I-78 and Route 139, and connections from the New Jersey Turnpike, the Garden State Parkway, and local streets in New Jersey (Figure 4B-6).

The highway analysis examined only the Manhattan-bound direction where delays and queues occur along I-78 and Route 139, including the four intersections along 12th Street in Jersey City, just west of the tunnel. The New Jersey-bound traffic was not analyzed because the highways in New Jersey generally operate with less congestion and the volumes are constrained by the tunnel at the Manhattan approaches. However, the Manhattan approaches to the Holland Tunnel are examined as part of the local traffic analysis.

AFFECTED ENVIRONMENT

The highway segment analysis of the existing conditions was performed using a Vissim microsimulation model calibrated to actual volumes and speeds based on data provided by StreetLight Data, Inc. The existing volumes were based on 2019 transaction data. The model provides several important performance metrics including travel time (seconds), travel speed (mph), and maximum queue length (feet).

Table 4B-16 presents a summary of existing conditions during the weekday AM, MD, and PM peak hours. The Vissim network for this highway segment includes intersections in New Jersey that were also analyzed separately using the Synchro traffic model (Section 4B.6).

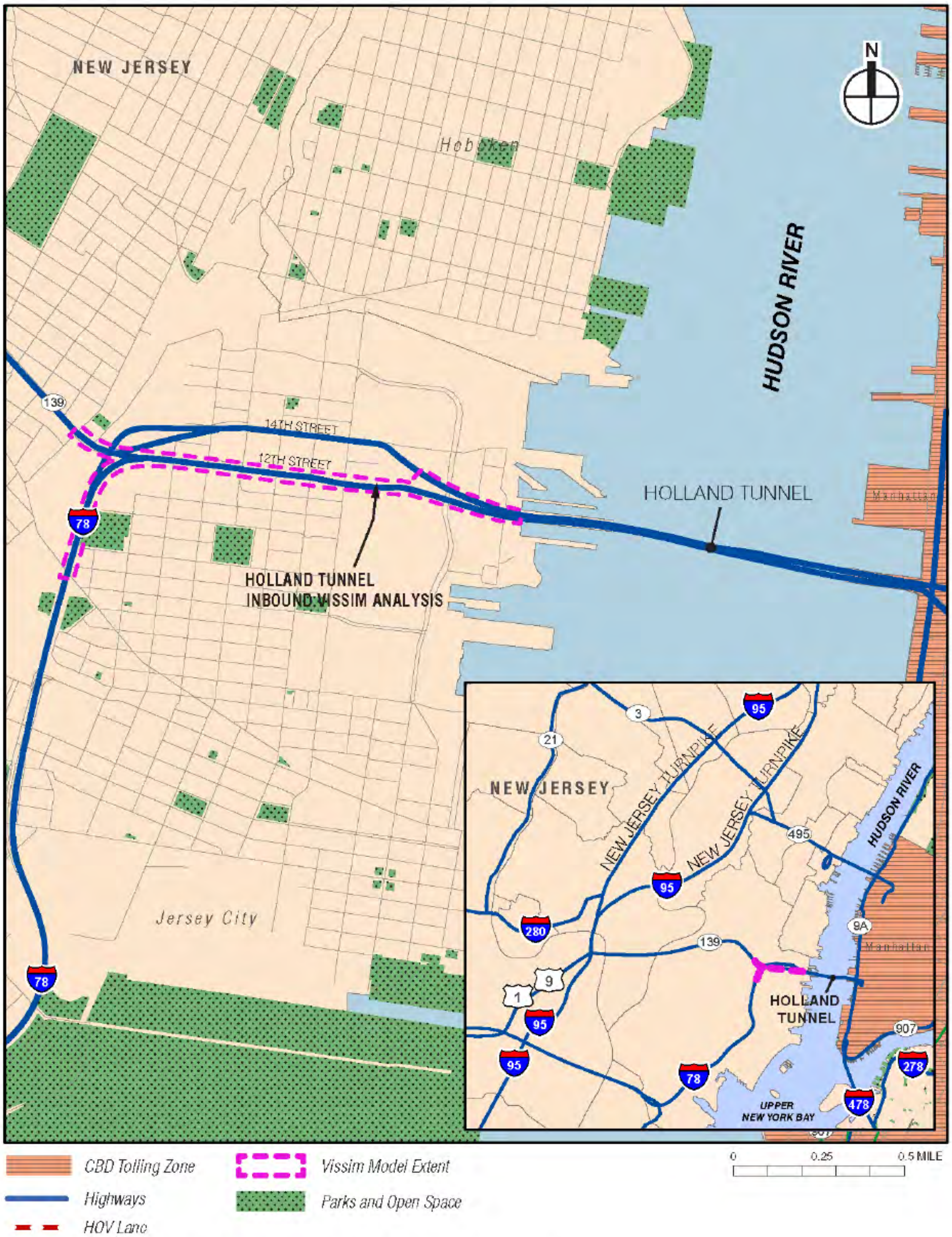
On a typical weekday, the Holland Tunnel carries 86,800 vehicles (41,800 Manhattan-bound and 45,000 New Jersey-bound). The peak hourly Manhattan-bound traffic volumes for the highway approaches are:

- 3,103 AM peak hour
- 2,439 MD peak hour
- 2,977 PM peak hour

The average speeds along I-78 approaching the Holland Tunnel are 7.0 mph, 12.3 mph, and 8.1 mph during the AM, MD, and PM peak hours, respectively. The average speeds along Route 139 approaching the Holland Tunnel are 6.8 mph, 10.9 mph, and 8.6 mph during the AM, MD, and PM peak hours, respectively.

The maximum queue lengths along I78, as measured west from the intersection at Jersey Avenue, are approximately 529 feet, 293 feet, and 444 feet during the AM, MD, and PM peak hours, respectively. The queue lengths along NJ Route 139, also measured from the intersection at Jersey Avenue, are generally much lower in the AM peak hour and there is no queue in the MD and PM peak hours. The signalized arterial roadway segment between Jersey Avenue and the Holland Tunnel portal is typically congested during the AM, MD, and PM peak hours. These intersections along this segment were analyzed using Synchro traffic model and are included in the intersection traffic analysis (Section 4B.6).

Figure 4B-6. Highways Leading to the Holland Tunnel



Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Table 4B-16. Existing Conditions: I-78 and Route 139

PERFORMANCE (2019)	AM (8 a.m. to 9 a.m.)	MD (Noon to 1 p.m.)	PM (5 p.m. to 6 p.m.)
Hourly Volume			
I-78	1,175	889	1,127
Route 139	1,928	1,550	1,850
Travel Time (min:sec)			
I-78	09:19	05:19	08:05
Route 139 Local	07:53	04:52	06:11
Route 139 Express	08:21	04:59	06:21
Travel Speed (miles per hour)			
I-78	7.0	12.3	8.1
Route 139 Local	6.8	10.9	8.6
Route 139 Express	6.4	10.7	8.4
Maximum Queue (feet)			
I-78	529	293	444
Route 139 Local	114	0	0
Route 139 Express	434	0	0

Source: WS, 2022.

Based upon the results of the BPM regional model for Tolling Scenario D (the tolling scenario that would likely generate the greatest amount of adverse traffic effects), and subsequent post-processing to obtain hourly volumes, there would be a small net decrease in trips across the Holland Tunnel in the Manhattan-bound direction during the AM, MD, and PM peak hours; therefore, a qualitative assessment of potential adverse traffic effects was performed for the No Action Alternative and CBD Tolling Alternative.

ENVIRONMENTAL CONSEQUENCES

For existing conditions and the 2023 No Action Alternative and 2023 CBD Tolling Alternative (Tolling Scenario D), **Table 4B-17** presents a summary of the overall changes in traffic volume. There is little anticipated change between the existing and No Action Alternative conditions and the assessment summarized below describes the incremental change in traffic volumes between the No Action Alternative and CBD Tolling Alternative for the tolling scenario that would likely generate the greatest amount of adverse traffic effects.

Table 4B-17. Holland Tunnel Eastbound Traffic Volumes during AM, MD and PM Peak Hours under Existing Conditions, No Action Alternative, and CBD Tolling Alternative

PEAK HOUR	EXISTING CONDITIONS	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (TOLLING SCENARIO D)
AM (8:00 a.m. to 9:00 a.m.)	3,103	3,109	3,060
MD (12:00 p.m. to 1:00 p.m.)	2,439	2,431	2,364
PM (5:00 p.m. to 6:00 p.m.)	2,977	2,975	2,912

Source: WSP, 2022.

Under the CBD Tolling Alternative, there would be a small reduction in traffic volumes during the AM, MD, and PM peak hours at the eastbound approaches to the Holland Tunnel and a small improvement in traffic

operations; therefore, there would not be an adverse traffic impact during any peak hour as described below.

AM Results (8:00 a.m. to 9:00 a.m.)

During the AM peak hour, traffic volumes are projected to decrease by a total of 49 vehicles, with approximately 18 vehicles along I-78 and approximately 31 vehicles along NJ Route 139 in the eastbound direction, resulting in a small improvement in traffic operations. Therefore, there would not be an adverse traffic effect during the AM peak hour.

MD Results (12:00 p.m. to 1:00 p.m.)

During the MD peak hour, traffic volumes are projected to decrease by a total of 67 vehicles, with approximately 24 vehicles along I-78 and approximately 43 vehicles along NJ Route 139 in the eastbound direction, resulting in a small improvement in traffic operations. Therefore, there would not be an adverse traffic effect during the MD peak hour.

PM Results (5:00 p.m. to 6:00 p.m.)

During the PM peak hour, traffic volumes are projected to decrease by a total of 63 vehicles, with approximately 24 vehicles along I-78, and approximately 39 vehicles along NJ Route 139 in the eastbound direction, resulting in a small improvement in traffic operations. Therefore, there would not be an adverse traffic effect during the PM peak hour.

In summary, there would be a net reduction in traffic volumes during the AM (-49), MD (-67), and PM (-63) peak hours at the Manhattan-bound approaches to the Holland Tunnel, and traffic operations would be expected to improve slightly; therefore, there would be no adverse effects as a result of Tolling Scenarios D, E, and F during the AM, MD, and PM peak hours. The net traffic reductions for Tolling Scenarios A, B, C, and G would be expected to be greater than under the remaining tolling scenarios; therefore, there would be expected to be a greater improvement in traffic operations. Since traffic volumes would decrease under all tolling scenarios, there would not be an adverse traffic effect at the Holland Tunnel and its approaches for any tolling scenario being considered.

4B.4.6 NJ Route 495 Approach to the Lincoln Tunnel

The Lincoln Tunnel is a major gateway to Midtown Manhattan from New Jersey. It provides direct access from NJ Route 495 and offers connections to and from the New Jersey Turnpike (I-95), Route 9, Route 3, and local streets in New Jersey (**Figure 4B-7**). In Manhattan, the Lincoln Tunnel provides connections to West 42nd Street, and south to West 30th Street and streets in between via the Lincoln Tunnel Expressway. In addition, the Lincoln Tunnel provides a direct connection for buses to the Port Authority Bus Terminal.

The highway analysis examined only the Manhattan-bound direction where delays and queues occur along NJ Route 495. The New Jersey-bound highway traffic generally operates with less congestion because the volumes are constrained by the tunnel at the Manhattan approaches (which are examined in **Section 4B.6**).

Figure 4B-7. Highways Leading to the Lincoln Tunnel

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

AFFECTED ENVIRONMENT

A qualitative highway segment analysis was performed because a reduction in traffic is projected by the BPM during the AM, MD, and PM peak hours. **Table 4B-18** presents a summary of the existing conditions during the weekday AM, MD, and PM peak hours.

Table 4B-18. Existing Conditions: New Jersey Route 495 Approach to the Lincoln Tunnel

PERFORMANCE (2019)	AM (8 a.m. to 9 a.m.)	MD (1 p.m. to 2 p.m.)	PM (5 p.m. to 6 p.m.)
Hourly Volume			
Helix to Lincoln Tunnel Entrance	1,725	1,631	771
Exclusive Bus Lane (XBL) to Lincoln Tunnel Entrance	512		
Local Ramps to Lincoln Tunnel Entrance	1,753	714	1,005
Processed Hourly Volume			
Helix to Lincoln Tunnel Entrance	1,731	1,577	775
XBL to Lincoln Tunnel Entrance	492		
Local Ramps to Lincoln Tunnel Entrance	1,541	729	957
Travel Time (min:sec)			
Helix to Lincoln Tunnel Entrance	10:45	09:47	02:03
XBL to Lincoln Tunnel Entrance	01:31		
Local Ramps to Lincoln Tunnel Entrance	02:23	00:55	04:38
Travel Speed (miles per hour)			
Helix to Lincoln Tunnel Entrance	3.5	3.9	18.4
XBL to Lincoln Tunnel Entrance	25.9		
Local Ramps to Lincoln Tunnel Entrance	6.5	17.0	3.4
Maximum Queue (feet)			
Helix to Lincoln Tunnel Entrance	8,443	951	32
XBL to Lincoln Tunnel Entrance	0		
Local Ramps to Lincoln Tunnel Entrance	1,289	0	1,681
Density (pc/mi/ln)			
Helix to Lincoln Tunnel Entrance	175	168	10
XBL to Lincoln Tunnel Entrance	19		
Level of Service (LOS)			
Helix to Lincoln Tunnel Entrance	F	F	A
XBL to Lincoln Tunnel Entrance	C	—	—

Source: WSP, 2022.

Based upon the results of the BPM for Tolling Scenario D, and subsequent post-processing to obtain hourly volumes, there would likely be a small decrease in trips across the Lincoln Tunnel in the Manhattan-bound direction during the AM, MD, and PM peak hours; therefore, a qualitative assessment of potential adverse traffic effects was performed for the CBD Tolling Alternative.

On a typical weekday, the Lincoln Tunnel carries 117,200 vehicles (53,900 Manhattan-bound and 63,300 New Jersey-bound). The following are peak hourly Manhattan-bound traffic volumes:

- 3,990 AM peak hour
- 2,345 MD peak hour
- 1,776 PM peak hour

The average speeds along the helix segment approaching the Lincoln Tunnel are 3.5 mph, 3.9 mph, and 18.4 mph during the AM, MD, and PM peak hours, respectively. The contra-flow XBL converts a New Jersey-bound general traffic lane on I-495 to serve as a Manhattan-bound bus-only lane. The XBL is in effect only during the AM peak period, and buses operate at an average speed of 25.9 mph during the AM peak hour. The general-purpose traffic entrance ramp from Park Avenue in Weehawken, New Jersey, has an average speed of 6.5 mph, 17.0 mph, and 3.4 mph during the AM, MD, and PM peak hours, respectively. The maximum queue lengths along NJ Route 495, measured west of the Lincoln Tunnel portal in New Jersey, are approximately 8,443 feet, 951 feet, and 32 feet during the AM, MD, and PM peak hours, respectively. The queue lengths along the entrance ramp from Park Avenue in Weehawken are approximately 1,289 feet, 0 feet, and 1,681 feet during the AM, MD, and PM peak hours, respectively. The NJ Route 495 approach to the Lincoln Tunnel operates at LOS F during the AM and MD peak hours and at LOS A during the PM peak hour.

ENVIRONMENTAL CONSEQUENCES

For existing conditions and the No Action Alternative and CBD Tolling Alternative Tolling Scenario D, **Table 4B-19** presents a summary of the overall changes in traffic volume at the Lincoln Tunnel approaches for each of the peak hours, and compares the existing conditions, No Action Alternative, and CBD Tolling Alternative. The existing data was derived from 2018 transaction data and adjusted to 2019 values. There is little anticipated change between existing and No Action Alternative conditions, and the assessment summarized below describes the incremental change traffic volumes between the No Action Alternative and Tolling Scenario D.

Table 4B-19. Lincoln Tunnel Traffic Volumes during AM, MD and PM Peak Hours under Existing Conditions, No Action Alternative, and CBD Tolling Alternative

PEAK HOUR	EXISTING CONDITIONS	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)
AM (8:00 a.m. to 9:00 a.m.) (including Exclusive Bus Lane)	3,990	3,955	3,869
MD (1:00 p.m. to 2:00 p.m.)	2,345	2,338	2,190
PM (5:00 p.m. to 6:00 p.m.)	1,776	1,780	1,706

Source: WSP, 2022.

In summary, there would be a net reduction in traffic volumes during the AM (-86), MD (-148), and PM (-74) peak hours at the Manhattan-bound approaches to the Lincoln Tunnel, and traffic operations would be expected to improve slightly; therefore, there would be no adverse effects as a result of Tolling Scenarios D, E, and F during the AM, MD, and PM peak hours. The net traffic reductions for Tolling Scenarios A, B, C, and G would be expected to be greater than under the remaining tolling scenarios; therefore, there would be

expected to be a greater improvement in traffic operations. Since traffic volumes would decrease under all tolling scenarios, there would not be an adverse traffic effect at the Lincoln Tunnel and its approaches for any of the tolling scenarios being considered.

AM Results (8:00 a.m. to 9:00 a.m.)

During the AM peak hour, traffic volumes are projected to decrease by approximately 43 vehicles along the helix and 43 vehicles along the Park Avenue ramp, resulting in a small improvement in traffic operations. No additional buses are anticipated on the XBL, which comprises approximately 2.2 percent of total AM peak-hour traffic. Therefore, there would not be an adverse traffic effect during the AM peak hour.

MD Results (1:00 p.m. to 2:00 p.m.)

During the MD peak hour, traffic volumes are projected to decrease by approximately 74 vehicles along the helix and 74 vehicles along Park Avenue ramp, resulting in a small improvement in traffic operations. Therefore, there would not be an adverse traffic effect during the MD peak hour.

PM Results (5:00 p.m. to 6:00 p.m.)

During the PM peak hour, traffic volumes are projected to slightly decrease, by approximately 37 vehicles along the helix and 37 vehicles along Park Avenue ramp, resulting in a small improvement in traffic operations. Therefore, there would not be an adverse traffic effect during the PM peak hour.

4B.4.7 Trans-Manhattan/Cross Bronx Expressway between the George Washington Bridge and I-87

The George Washington Bridge is a major crossing carrying I-95 and US Routes 1 and 9 across the Hudson River for trips between New Jersey and Manhattan as well as the Bronx, Queens, and Brooklyn. I-95 continues along segments known as the Trans-Manhattan Expressway *[(as it crosses Upper Manhattan)]* and the Cross Bronx Expressway *[(through the Bronx)]* and provides connections to the Henry Hudson Parkway, Major Deegan Expressway, Harlem River Drive, and other local streets and highways (Figure 4B-8).

The highway analysis examines only the outbound (westbound/New Jersey-bound) direction of the Trans-Manhattan Expressway where it enters the George Washington Bridge (the convergence and maximum accumulation of vehicles from the feeder roadways to the George Washington Bridge). The BPM forecasts the traffic volumes under the representative tolling scenario in the inbound (eastbound) direction to be lower; therefore, the eastbound direction was not analyzed.

In the outbound (westbound) direction increases in vehicular trips are anticipated to occur along the major connections to the bridge approach due to circumferential diversion of through Manhattan CBD traffic taking advantage of the toll-free trans-Hudson crossings in the westbound direction to avoid the CBD toll.

Projections of changes in traffic volumes along the Trans-Manhattan/Cross Bronx Expressway as well as other feeder routes to the George Washington Bridge are based on existing bridge volume data, BPM projections of changes in traffic volumes, and travel patterns derived from data provided by StreetLight Data, Inc. used to determine the distribution of traffic using the George Washington Bridge.

Figure 4B-8. Highways Leading to the Trans-Manhattan/Cross Bronx Expressway

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Due to the lack of availability of an existing calibrated highway traffic model and gaps in the pre-COVID-19 pandemic traffic data, the analysis of the Trans-Manhattan/Cross Bronx Expressway relies on a combination of analytical quantitative and qualitative evaluation of potential adverse effects. The potential traffic effects along the Trans-Manhattan/Cross Bronx Expressway corridor were estimated from the Long Island Expressway Vissim model with appropriate adjustments for the relative increase in traffic volumes and the initial No Action speeds

AFFECTED ENVIRONMENT

On a typical weekday, the George Washington Bridge carries approximately 300,000 vehicles (145,000 Manhattan-bound and 155,000 New Jersey-bound). The peak-hour westbound/New Jersey-bound traffic volumes for the bridge are:

- 7,028 AM peak hour
- 8,315 MD peak hour
- 9,660 PM peak hour

ENVIRONMENTAL CONSEQUENCES

The incremental changes in traffic resulting from the CBD Tolling Alternative were assigned to the highways leading to the George Washington Bridge using data provided by StreetLight Data, Inc. For each time period, estimates were made as to where the majority of traffic originated from before combining along the Trans-Manhattan Expressway. Over the course of the day, the majority of traffic destined to the George Washington Bridge in the westbound direction comes from the Cross Bronx Expressway, Harlem River Drive, Henry Hudson Parkway and Major Deegan Expressway. **Table 4B-20** presents the proportion of traffic along these main roadways that lead to the George Washington Bridge.

Table 4B-20. Roadway Contribution by Time Period to George Washington Bridge Traffic

HIGHWAY CONNECTIONS TO GEORGE WASHINGTON BRIDGE	AM PEAK (6 a.m. to 10 a.m.) % Traffic	MD PEAK (10 a.m. to 4 p.m.) % Traffic	PM PEAK (4 p.m. to 8 p.m.) % Traffic
Harlem River Drive	29.5%	42.4%	36.7%
Cross Bronx Expressway – Westbound	43.7%	26.6%	26.1%
Henry Hudson Parkway (north- and southbound)	12.9%	17.7%	24.4%
Major Deegan Expressway (north- and southbound)	13.8%	13.4%	12.7%
TOTAL	**100.0%**	**100.0%**	**100.0%**

Source: StreetLight Data, Inc. (2019) and WSP analysis.

Under Tolling Scenario D, there would be increases in traffic across the George Washington Bridge in the westbound/New Jersey-bound direction during the AM, MD, and PM peak hours of 87, 826, and 414 vehicles, respectively. These increases would affect routes feeding the George Washington Bridge, including the Henry Hudson Parkway, the Trans-Manhattan Expressway westbound, the Harlem River Drive, the Major Deegan Expressway, and the Cross Bronx Expressway westbound. **Table 4B-21** summarizes the

incremental changes in westbound/New Jersey-bound traffic along the major highways leading to the George Washington Bridge.

Table 4B-21. Projected Increase in Traffic, compared to the No Action Alternative, along Trans-Manhattan and Cross Bronx Expressway Corridor

FACILITY/HIGHWAY	PEAK-HOUR VEHICLES		
	AM	MD	PM
George Washington Bridge	**87**	**826**	**414**
From Henry Hudson Parkway	11	146	101
Trans-Manhattan Expressway	**76**	**680**	**313**
From Harlem River Drive	26	350	152
From Major Deegan Expressway	12	110	53
Cross Bronx Expressway	**38**	**220**	**108**

Source: 2019 Port Authority of New York and New Jersey traffic data at the George Washington Bridge, 2019 StreetLight Data, Inc. origin-destination data, and WSP analysis.

An analytical and qualitative assessment of anticipated traffic effects is presented below during the AM, MD, and PM peak hours based upon the estimated increases in peak hour volumes and estimated levels of congestion.

AM Results (7:00 a.m. to 8:00 a.m.)

During the AM peak hour, traffic volumes are projected to increase by approximately 87 vehicles on the George Washington Bridge, which would be a 1.2 percent increase over existing volumes. Approximately 11 vehicles would be added to the Henry Hudson Parkway, 26 vehicles to Harlem River Drive, 12 vehicles to the Major Deegan Expressway, and 38 vehicles to the Cross Bronx Expressway westbound. These small increases in traffic volumes are well within 5 percent and there would not be a noticeable change in speeds and travel times during the AM peak hour; therefore, there would not be an adverse effect under SEQRA.

MD Results (3:00 p.m. to 4:00 p.m.)

During the MD peak hour, traffic volumes are projected to increase by approximately 826 vehicles on the George Washington Bridge, which would be an 8.8 percent increase over existing volumes. Approximately 146 vehicles would be added to the Henry Hudson Parkway, 350 vehicles to Harlem River Drive, 110 vehicles to the Major Deegan Expressway, and 220 vehicles to the Cross Bronx Expressway westbound. It is expected that delays and travel times along these roadways would increase during the MD peak hour. Along the Cross Bronx Expressway and the Trans-Manhattan Expressway, the increases in projected volumes would be considered an adverse effect under the volume increase criteria of greater than 5 percent used to determine adverse effects under SEQRA.

Adverse effects that would arise if Tolling Scenario D or another similar tolling scenario were implemented will be minimized through implementing Transportation Demand Management measures such as ramp metering, motorist information, signage, and/or targeted toll policy modifications to reduce diversions. The Project Sponsors will undertake monitoring of traffic patterns specifically tailored to the adopted tolling scenario—commencing prior to implementation with data collection approximately 3 months after the start of project operations—to determine whether the predicted adverse effects are occurring and to

determine the appropriate Transportation Demand Management measures (or improvement in existing Transportation Demand Management measures) to be implemented. The monitoring program will examine changes in traffic volumes, changes in speeds, and changes in delays along the affected highway corridors. Volume changes will be determined from before/after traffic counts (where available); speed changes will be determined from actual before/after speeds based on data provided by StreetLight Data, Inc.; and the change in delay along major highway corridors will be determined based on actual speeds based on data provided by StreetLight Data, Inc. The monitoring program will inform the development and implementation of appropriate Transportation Demand Management measures and *[subsequently]* possible adjustments to the tolling policy should traffic volumes increase by more than 5 percent and delays increase 2.5 minutes *[or more]*.

PM Results (5:00 p.m. to 6:00 p.m.)

During the PM peak hour, traffic volumes are projected to increase by approximately 414 vehicles on the George Washington Bridge, which would be a 4.3 percent increase over existing volumes. Approximately 101 vehicles would be added to the Henry Hudson Parkway, 152 vehicles to Harlem River Drive, 53 vehicles to the Major Deegan Expressway, and 108 vehicles to the Cross Bronx Expressway westbound. These relatively small increases in traffic volumes would be within the 5 percent threshold, and there would not be an adverse effect under SEQRA.

4B.4.8 FDR Drive/Lower East Side—East 10th Street to the Brooklyn Bridge

ENVIRONMENTAL CONSEQUENCES

As with the Trans-Manhattan/Cross Bronx Expressway corridor, to be able to appropriately address the questions and concerns expressed by communities affected by any traffic changes in this corridor, additional traffic counts were obtained to complete further analysis. Under the CBD Tolling Alternative, the FDR Drive would experience a net decline in traffic at 60th Street, resulting in improved travel times and operating conditions along the upper FDR Drive and the segment between East 23rd Street and East 60th Street. However, the lower FDR Drive between East 10th Street and the Brooklyn Bridge would experience a net increase in traffic, with diverted traffic greater than the suppression of traffic due to CBD tolling. Under all tolling scenarios, the FDR Drive would become a more competitive route for some origin-destination pairs, thereby offsetting the overall decline in projected traffic along the FDR Drive in this specific area south of East 10th Street.

The highest projected increase in traffic along the lower FDR Drive would occur under Tolling Scenarios D, E, and F, which have the highest levels of discounts, exemptions, and crossing credits and therefore the highest tolls that would result in the greatest levels of diversions and changes in travel patterns. The BPM analyses showed a potential 5 percent to 9 percent increase in daily traffic volumes along the northbound FDR Drive and a 19 percent to 26 percent increase in daily traffic volumes along the southbound FDR Drive in the section between East 10th Street and the Brooklyn Bridge.

Based upon a select link analysis[22] of the lower FDR Drive, the net increase in traffic in this segment would come from three primary markets:

- **Queens:** Under the CBD Tolling Alternative, with the reduction in lanes along the BQE as part of the No Action Alternative from three lanes to two lanes in each direction, some trips from Queens to Brooklyn would divert to the Ed Koch Queensboro Bridge upper level, then to the southbound FDR Drive, and then to the Brooklyn Bridge (or Hugh L. Carey Tunnel) to bypass congestion on the BQE. This alternate routing, a toll-free route, would become more attractive under the CBD Tolling Alternative due to an overall reduction of traffic along the upper portion of the FDR Drive between 60th Street and West 23rd Street. The higher the CBD toll, the more traffic would be suppressed along the upper FDR Drive and the more attractive the FDR Drive becomes as a toll-free alternative to the BQE for travel between Queens and Brooklyn. The BPM does not show a northbound diversion from Brooklyn to Queens trips because this route would be tolled under all tolling scenarios because it would require re-entry into the CBD zone via a local street to access one of the East River crossings to Queens.
- **The Bronx:** Some trips between Bronx and Brooklyn would use the FDR Drive as an alternate to the congested BQE via the Third Avenue Bridge and the Willis Avenue Bridge, which would provide a toll-free connection between the Major Deegan Expressway (I-87) and the FDR Drive.
- **North Bergen County:** Some trips between North Bergen County and Brooklyn would divert to the FDR Drive as an alternative to the West Side Highway/Route 9A and local streets used to access the Brooklyn Bridge.

Table 4B-22 summarizes the changes in traffic volumes along the FDR Drive between East 10th Street and the Brooklyn Bridge.

[22] A select link analysis examines all trips using a particular highway segment and tracks the volume of traffic using the link from each origin-destination zone. This type of analysis allows a detailed review of travel pattern and routing changes.

Table 4B-22. Estimated Increase of Traffic on the Lower FDR Drive*

PERIOD		NORTHBOUND		SOUTHBOUND	
		Low	High	Low	High
AM	Peak Period	1,586	1,871	1,947	2,735
	Peak Hour	324	370	294	356
MD	Peak Period	1,219	1,535	2,524	4,117
	Peak Hour	249	313	281	458
PM	Peak Period	83	403	1,776	2,918
	Peak Hour	61	231	404	666
Daily		2,352	4,472	8,845	12,145

Source: WSP, 2022.
Notes:
1. Daily volumes will not equal peak-period increments due to values being pulled from differing tolling scenarios.
2. Peak-period increments are from the BPM (unadjusted).
3. Peak-hour volumes are estimated using an average and adjusted for accuracy.
4. Low = Tolling Scenarios A, B, C, and G
5. High = Tolling Scenarios D, E, and F

* NYCDOT reduced the number of lanes on the BQE from three lanes to two lanes in each direction on August 30, 2021, between Atlantic Avenue and Sands Street, to preserve the life of the cantilever structure. This has caused some motorists to divert to the FDR Drive. The Project is expected to cause additional motorists to divert to the FDR Drive to avoid congestion along the BQE.

AM Peak Hour (8:00 a.m. to 9:00 a.m.)

In the northbound direction, the AM peak-hour volume is expected to increase by about 324 to 370 vehicles. Typically, traffic flows freely along the lower FDR Drive in the northbound direction during the AM peak and it is anticipated that the additional traffic can be accommodated. In the southbound direction, the AM peak-hour volume is expected to increase by about 294 to 356 vehicles. Typically, traffic flows freely along the lower FDR Drive in the southbound direction during the AM peak, and it is anticipated that the additional traffic can be accommodated for all tolling scenarios.

MD Peak Hour (1:00 p.m. to 2:00 p.m.)

In the northbound direction, the MD peak-hour volume is expected to increase by about 249 to 313 vehicles. Typically, traffic flows freely along the lower FDR Drive in the northbound direction during the MD peak and it is anticipated that the additional traffic can be accommodated. In the southbound direction, the peak-hour volume is expected to increase by about 281 to 458 vehicles. Typically, traffic flows freely along the lower FDR Drive in the southbound direction during the MD peak, and it is anticipated that the additional traffic can be accommodated for all tolling scenarios.

PM Peak Hour (5:00 p.m. to 6:00 p.m.)

In the northbound direction, the PM peak-hour volume is expected to increase by about 61 to 231 vehicles. Typically, traffic flows freely along the lower FDR Drive in the northbound direction during the PM peak and it is anticipated that the additional traffic can be accommodated for all scenarios, aside from Tolling Scenario B. Under this tolling scenario, the projected increase in traffic volume would be marginally above the 5 percent threshold (at 5.8 percent), resulting in potential adverse effects.

In the southbound direction, the PM peak-hour volume is expected to increase by about 404 to 666 vehicles, depending on the tolling scenario. Typically, there is severe congestion along the lower FDR Drive in the southbound direction during the PM peak, and it is not anticipated that the additional traffic can be accommodated without adverse effects. Since the FDR Drive southbound is congested during the PM peak hour and the increase in volume would exceed the 5 percent threshold, an adverse traffic effect is projected.

In summary, all tolling scenarios would result in increases in daily and peak-hour traffic along the lower FDR Drive, between East 10th Street and the Brooklyn Bridge by more than the 5 percent threshold. Tolling Scenarios A, B, and G are generally anticipated to have lower potential increases in traffic volumes, and Tolling Scenarios D, E, and F are anticipated to have higher increases in traffic volumes, with some variation based on direction. Tolling Scenario C is anticipated to have increases in traffic volumes somewhere in the middle.

In the northbound direction, projected increases in traffic volumes would be lower than in the southbound direction, and there is capacity along the lower FDR Drive to handle some or all of the additional traffic without causing adverse effects during the AM and MD peak hours. However, during the PM peak hour, it is not anticipated that the additional traffic can be accommodated without some potential adverse effects under Tolling Scenario B. However, the adverse effects in the northbound direction are expected to be marginal.

In the southbound direction, potential diversions to the FDR Drive would be higher. Typically, traffic moves freely in this segment, except during the PM peak period when there is severe congestion. It is anticipated that sufficient reserve capacity is available to handle the expected increase in traffic during the AM and MD peak hours for some of the tolling scenarios without adverse effects. However, during the PM peak hour when traffic congestion is prevalent, it is not anticipated that the additional traffic can be accommodated without adverse effects. Therefore, an adverse traffic effect is projected during the PM peak hour in the southbound direction.

Adverse effects that would arise if Tolling Scenario D or another similar tolling scenario were implemented will be minimized through implementing Transportation Demand Management measures such as ramp metering, motorist information, signage, and/or targeted toll policy modifications to reduce diversions. The Project Sponsors will undertake monitoring of traffic patterns specifically tailored to the adopted tolling scenario—commencing prior to implementation with data collection approximately 3 months after the start of project operations—to determine whether the predicted adverse effects are occurring and to determine the appropriate Transportation Demand Management measures (or improvement in existing Transportation Demand Management measures) to be implemented. The monitoring program will examine changes in traffic volumes, changes in speeds, and changes in delays along the affected highway corridors. Volume changes will be determined from before/after traffic counts (where available); speed changes will be determined from actual before/after speeds based on data provided by StreetLight Data, Inc.; and the change in delay along major highway corridors will be determined based on actual speeds based on data provided by StreetLight Data, Inc. The monitoring program will inform the development and

implementation of appropriate Transportation Demand Management measures and *[subsequent]* possible adjustments to the tolling policy should traffic volumes increase by more than 5 percent and delays increase *[by]* 2.5 minutes *[or more]*.

4B.4.9 Bayonne Bridge

AFFECTED ENVIRONMENT

The highway segment analysis was performed using an HCS with incremental volumes from BPM analyses. The analysis provides performance metrics including speed, density (in passenger cars per mile per lane) and overall LOS. Table 4B-23, Table 4B-24, Table 4B-25, and Table 4B-26 present a summary of existing, No Action Alternative, and CBD Tolling Alternative (Tolling Scenario D) conditions during the weekday AM, MD, PM, and LN peak hour. A map of the analyzed location is shown in Figure 4B-9.

ENVIRONMENTAL CONSEQUENCES

For existing conditions and the No Action Alternative and CBD Tolling Alternative Tolling Scenario D, Table 4B-23, Table 4B-24, Table 4B-25, and Table 4B-26present a summary of the overall changes in traffic volume at the Bayonne Bridge for each of the peak hours, and compares the existing conditions, No Action Alternative, and CBD Tolling Alternative. The existing data was obtained from BPM. There is little anticipated change between the No Action Alternative and CBD Tolling Alternative (Tolling Scenario D), the assessment summarized below describes the incremental change in traffic volumes between the No Action Alternative and Tolling Scenario D.

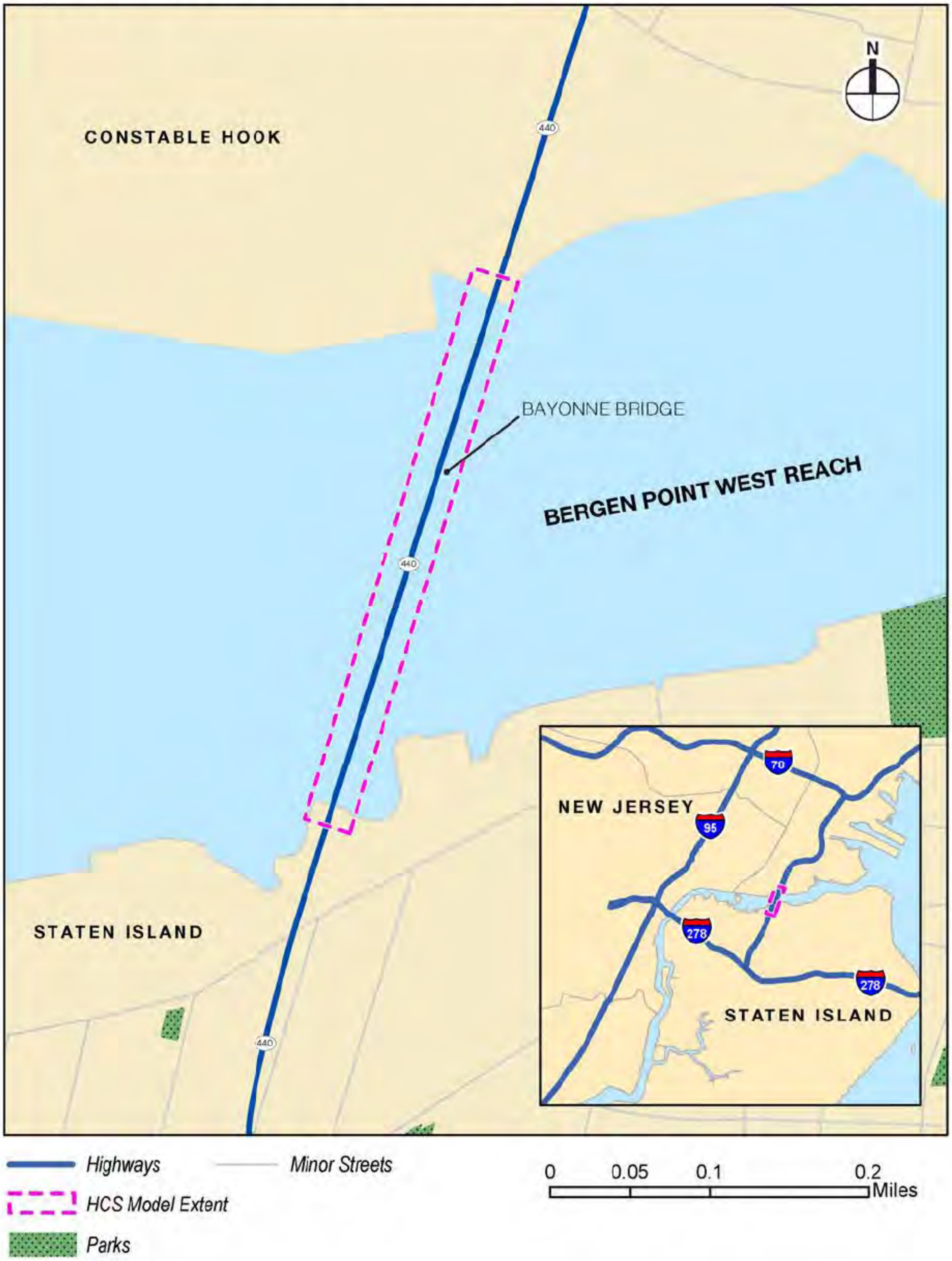
In summary, there would be a net increase in northbound traffic volumes during the AM (376), MD (317), PM (213), and LN (54) peak hours at the Bayonne Bridge. There would be a net increase in southbound traffic volumes during the AM (81), MD (97), PM (148), and LN (1) peak hours at the Bayonne Bridge. There would be no adverse effects as a result of the tolling scenarios with the largest traffic increases during the AM, MD, PM, and LN peak hours. Since traffic volumes would increase by less under the other tolling scenarios, there would not be an adverse traffic effect for any of the tolling scenarios being considered.

AM Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 376 vehicles heading into New Jersey. This would result in the northbound density along Route 440 to increase by approximately 4.9 pc/mi/ln and the LOS would decrease from LOS B to LOS C. Under the SEQRA criteria, LOS C during the AM peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

Traffic in the southbound direction is projected to increase by approximately 81 vehicles heading into Staten Island. This would result in the southbound density along Route 440 to increase by approximately 1 pc/mi/ln and the LOS would decrease from LOS A to LOS B. Under the SEQRA criteria, LOS B during the AM peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

Figure 4B-9. Highways Leading to the Bayonne Bridge



Source: WSP,, 2022.

MD Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 317 vehicles heading into New Jersey. This would result in the northbound density along Route 440 to increase by approximately 4.3 pc/mi/ln and the LOS would decrease from LOS A to LOS B. Under the SEQRA criteria, LOS B during the MD peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

Traffic in the southbound direction is projected to increase by approximately 97 vehicles heading into Staten Island. This would result in the southbound density along Route 440 to increase by approximately 1.3 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the MD peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

PM Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 213 vehicles heading into New Jersey. This would result in the northbound density along Route 440 to increase by approximately 2.8 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the PM peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

Traffic in the southbound direction is projected to increase by approximately 148 vehicles heading into Staten Island. This would result in the southbound density along Route 440 to increase by approximately 1.8 pc/mi/ln and the LOS would remain LOS B. Under the SEQRA criteria, LOS B during the PM peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

LN Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 54 vehicles heading into New Jersey. This would result in the northbound density along Route 440 to increase by approximately 0.7 pc/mi/ln and the LOS service would remain LOS A. Under the SEQRA criteria, LOS A during the LN peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

Traffic in the southbound direction is projected to increase by approximately one vehicle heading into Staten Island. This would result in the southbound density along Route 440 to increase by approximately 0 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the LN peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

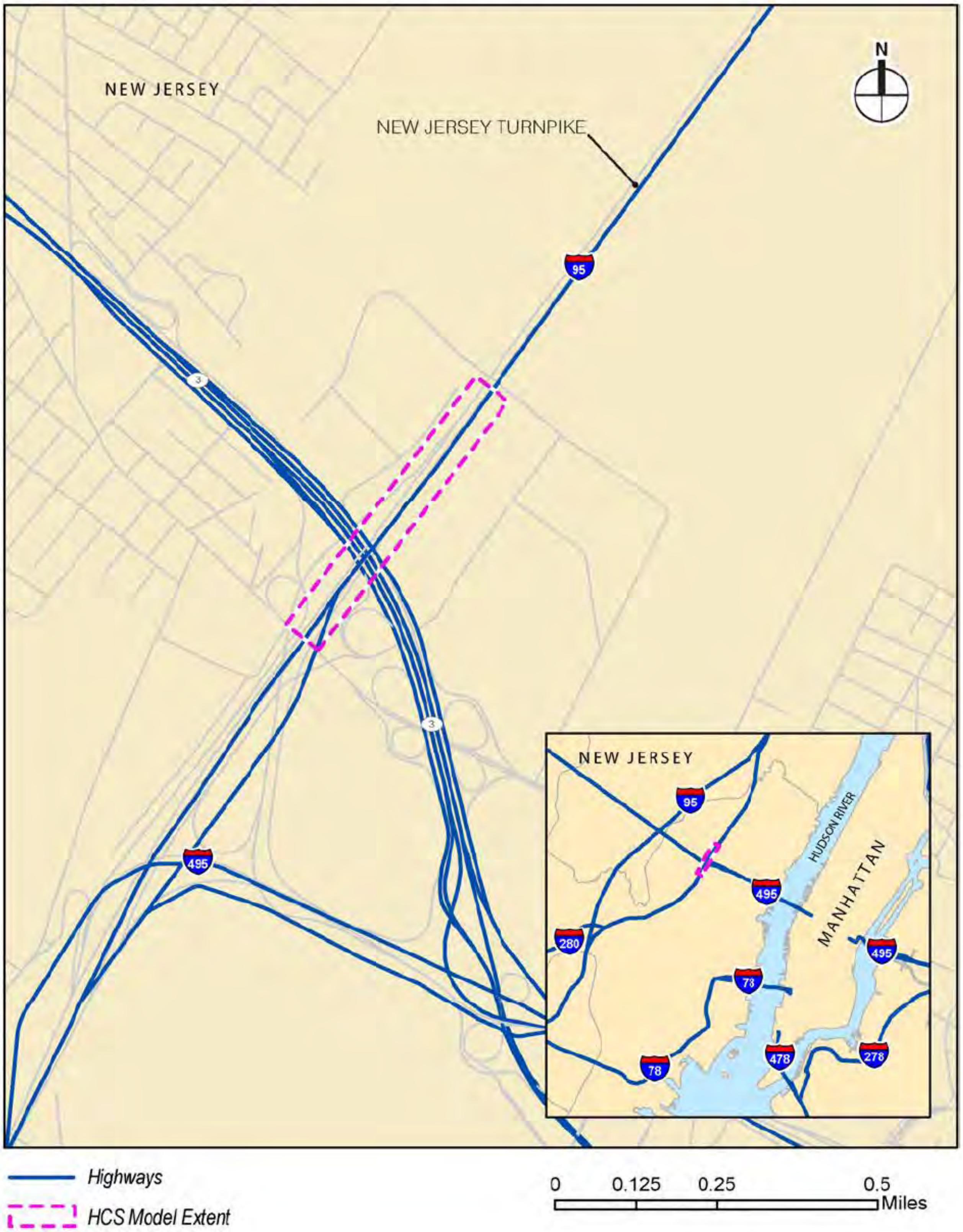
4B.4.10 Eastern Spur of I-95 New Jersey Turnpike

AFFECTED ENVIRONMENT

The highway segment analysis was performed using an HCS with existing volumes from BPM analyses. The analysis provides performance metrics including density (in passenger cars per mile per lane) and overall LOS. Table 4B-23, Table 4B-24, Table 4B-25, and Table 4B-26 present a summary of existing, No Action Alternative, and CBD Tolling Alternative Scenario D conditions during the weekday AM, MD, PM, and LN peak hour. A map of the analyzed location is shown in Figure 4B-10.

DOT_0036458

Figure 4B-10. Highways Leading to the Eastern Spur of I-95



Source: WSP, 2022.

ENVIRONMENTAL CONSEQUENCES

For existing conditions and the No Action Alternative and CBD Tolling Alternative Tolling Scenario D, Table 4B-23, Table 4B-24, Table 4B-25, and Table 4B-26 present a summary of the overall changes in traffic volume at the I-95 eastern spur for each of the peak hours, and compares the existing conditions, No Action Alternative, and CBD Tolling Alternative. The existing data was obtained from the BPM. There is little anticipated change between the No Action Alternative and CBD Tolling Alternative Tolling Scenario D. The assessment summarized below describes the incremental change in traffic volumes between the No Action Alternative and Tolling Scenario D.

In summary, there would be a net increase in northbound traffic volumes during the AM (53), MD (63), PM (80) peak hour and a net decrease during the LN (-16) peak hour at the Bayonne Bridge. There would be a net increase in southbound traffic volumes during the AM (98), MD (218), PM (56), and LN (104) peak hours at the Eastern Spur of the New Jersey Turnpike. There would be no adverse effects as a result of the tolling scenarios with the largest increases in traffic volumes during the AM, MD, PM, and LN peak hours. Since traffic volumes would increase by less under the other tolling scenarios, there would not be an adverse traffic effect for any of the tolling scenarios being considered.

AM Results

With CBD tolling, traffic in the northbound direction to the George Washington Bridge is projected to increase by approximately 53 vehicles. This would result in the northbound density along I-95 to increase by approximately 0.4 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the AM peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

Traffic in the southbound direction from the George Washington Bridge is projected to increase by approximately 98 vehicles. This would result in the southbound density along I-95 to increase by approximately 0.6 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the AM peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

MD Results

With CBD tolling, traffic in the northbound direction to the George Washington Bridge is projected to increase by approximately 63 vehicles. This would result in the northbound density along I-95 to increase by approximately 0.4 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the MD peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

Traffic in the southbound direction from the George Washington Bridge is projected to increase by approximately 218 vehicles. This would result in the southbound density along I-95 to increase by approximately 1.7 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the MD peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

PM Results

With CBD tolling, traffic in the northbound direction to the George Washington Bridge is projected to increase by approximately 80 vehicles. This would result in the northbound density along I-95 to increase by approximately 0.5 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the PM peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

Traffic in the southbound direction from the George Washington Bridge is projected to increase by approximately 56 vehicles. This would result in the southbound density along I-95 to increase by approximately 0.4 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the PM peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

LN Results

With CBD tolling, traffic in the northbound direction to the George Washington Bridge is projected to decrease by approximately 16 vehicles. This would result in the northbound density along I-95 to decrease by approximately 0.2 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the LN peak hour is considered acceptable and therefore is not considered to create an adverse effect.

Traffic in the southbound direction from the George Washington Bridge is projected to increase by approximately 104 vehicles. This would result in the southbound density along I-95 to increase by approximately 0.8 pc/mi/ln and the LOS would remain LOS A. Under the SEQRA criteria, LOS A during the LN peak hour is considered acceptable and, therefore, is not considered to create an adverse effect.

4B.4.11 RFK Bridge between Queens and Ramps to/from Manhattan

AFFECTED ENVIRONMENT

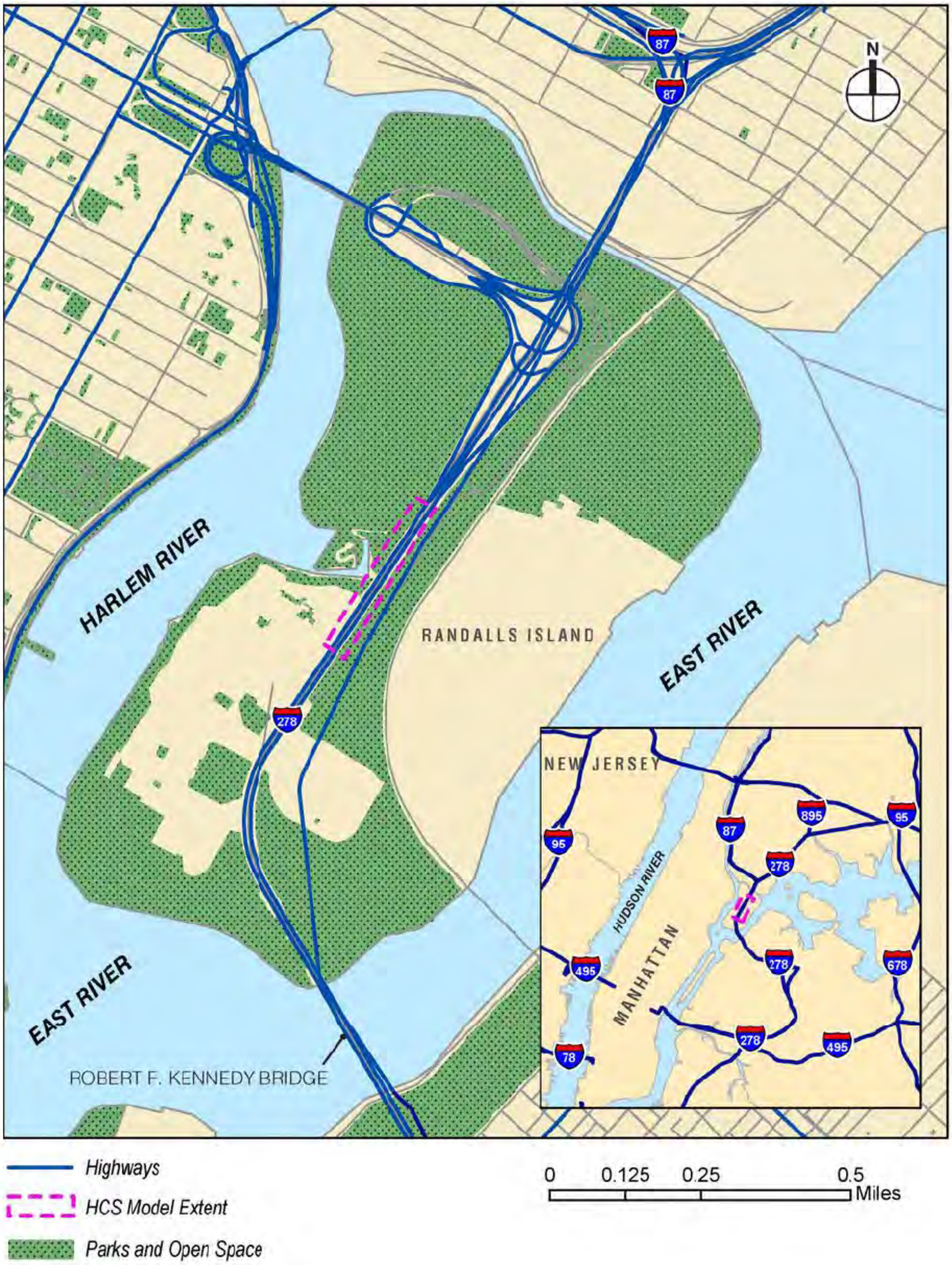
The highway segment analysis was performed using the HCS with existing volumes and incremental volumes from BPM analyses. The analysis provides performance metrics including density (in passenger cars per mile per lane) and overall LOS. Table 4B-23, Table 4B-24, Table 4B-25, and Table 4B-26 present a summary of existing, No Action Alternative, and CBD Tolling Alternative Scenario D conditions during the weekday AM, MD, PM, and LN peak hour. Figure 4B-11 shows the analyzed location.

ENVIRONMENTAL CONSEQUENCES

For existing conditions and the No Action Alternative and CBD Tolling Alternative Tolling Scenario D, Table 4B-23, Table 4B-24, Table 4B-25, and Table 4B-26 present a summary of the overall changes in traffic volume at the RFK Bridge (between Queens and ramps to/from Manhattan) for each of the peak hours, and compares the existing conditions, No Action Alternative, and CBD Tolling Alternative. The existing data was obtained from BPM. There is an anticipated change between the No Action Alternative and Tolling Scenario D, the assessment summarized below describes the incremental change in traffic volumes between the No Action Alternative and Tolling Scenario D.

In summary, there would be a net increase in northbound traffic volumes during the AM (508), MD (261), PM (634), and LN (93) peak hours at the RFK Bridge. There would be a net increase in southbound traffic volumes during the AM (396), MD (474), PM (612), and LN (598) peak hours at the RFK Bridge. There would be potential change in LOS from D to marginally E under the tolling scenarios with the largest increases in local traffic volumes during the AM and PM peak hours. However, the speeds would remain about the same or slightly lower at approximately 40 mph and delays would be below the 2.5-minute threshold. Therefore, there would not be an adverse effect at the RFK under any of the tolling scenarios in both the northbound and southbound directions. Therefore, there would not be an adverse traffic effect at the RFK Bridge.

Figure 4B-11. Highways Leading to the Robert F. Kennedy Bridge



Source: WSP, 2022.

AM Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 508 vehicles heading into Manhattan or Bronx. This would result in the northbound density along I-278 to increase by approximately 3.6 pc/mi/ln. There would be potential change in LOS from D to marginally E under the tolling scenarios with the largest increases in traffic volumes. However, the speeds would remain about the same at approximately 40 mph and increases in delays would be below the 2.5-minute threshold; therefore, there would not be an adverse traffic effect during the AM in the northbound direction. Traffic in the southbound direction is projected to increase by approximately 396 vehicles heading into Queens. This would result in the southbound density along I-278 to increase by approximately 2.7 pc/mi/ln. There would be a potential change in LOS from D to marginally E under the tolling scenarios with the largest increases in traffic volumes. However, the speeds would remain about the same at approximately 40 mph and increases in delays would be below the 2.5-minute threshold; therefore, there would not be an adverse traffic effect during the AM in the southbound direction.

Table 4B-23 summarizes the changes in traffic volumes, density, and LOS between existing conditions, the No Action Alternative, and the CBD Tolling Alternative (Tolling Scenario D) for the Bayonne Bridge, RFK Bridge, and I-95 Eastern Spur for the AM time period.

MD Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 261 vehicles heading into Manhattan or Bronx. This would result in the northbound density along I-278 to increase by approximately 2.4 pc/mi/ln and the LOS would remain LOS D. Speeds would remain about the same at 40 mph and the increase in delay would be small and well below the 2.5-minute threshold.

Traffic in the southbound direction is projected to increase by approximately 474 vehicles heading into Queens. This would result in the southbound density along I-278 to increase by approximately 3.3 pc/mi/ln. and the LOS service would decrease from LOS C to D. Speeds would remain about the same at 40 mph or higher and the increase in delay would be small and well below the 2.5-minute threshold.

Table 4B-24 summarizes the changes in traffic volumes, density, and LOS between existing conditions, the No Action Alternative, and the CBD Tolling Alternative (Tolling Scenario D) for the Bayonne Bridge, RFK Bridge, and I-95 Eastern Spur for the MD time period.

Table 4B-23. Highway Capacity Software Performance Measures (AM)

DIRECTION	LOCATION	HOURLY VOLUME			
		EXISTING CONDITION	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume					
Northbound	Bayonne Bridge	1,075	1,091	1,467	376
	RFK Bridge	4,452	4,575	5,083	508
	Eastern Spur I-95 (Pre-ramp)	152	152	208	56
	Merge from 495	641	660	657	-3
	Eastern Spur I-95 (Post-ramp)	793	811	865	53
Southbound	Bayonne Bridge	659	678	759	81
	RFK Bridge	4,951	5,127	5,524	396
	Eastern Spur I-95 (Pre-ramp)	1,063	1,145	1,244	98
	Diverge to 495	630	627	686	59
	Eastern Spur I-95 (Post-ramp)	433	519	558	39
Density (pc/mi/ln)					
Northbound	Bayonne Bridge	15.4	15.6	20.5	4.9
	RFK Bridge	31.1	32	35.6	3.6
	Eastern Spur I-95 (Pre-ramp)	1.4	1.4	1.8	0.4
	Merge from 495	8.2	8.4	8.6	0.2
	Eastern Spur I-95 (Post-ramp)	6.5	6.7	7.1	0.4
Southbound	Bayonne Bridge	10.5	10.8	11.8	1
	RFK Bridge	34.4	35.6	38.3	2.7
	Eastern Spur I-95 (Pre-ramp)	8.6	9.3	9.9	0.6
	Diverge to 495	4.9	5.2	5.6	0.4
	Eastern Spur I-95 (Post-ramp)	3.4	4.1	4.3	0.2
Level of Service (LOS)					
Northbound	Bayonne Bridge	B	B	C	—
	RFK Bridge	D	D	E	X
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Merge from 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—
Southbound	Bayonne Bridge	A	A	B	—
	RFK Bridge	D	E	E	X
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Diverge to 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—

Source: WSP, 2022.

Table 4B-24. Highway Capacity Software Performance Measures (MD)

DIRECTION	LOCATION	HOURLY VOLUME			
		EXISTING CONDITION	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume					
Northbound	Bayonne Bridge	459	434	751	317
	RFK Bridge	4,325	4,381	4,642	261
	Eastern Spur I-95 (Pre-ramp)	225	195	237	42
	Merge from 495	572	569	590	21
	Eastern Spur I-95 (Post-ramp)	798	764	827	63
Southbound	Bayonne Bridge	592	585	683	97
	RFK Bridge	3,430	3,551	4,025	474
	Eastern Spur I-95 (Pre-ramp)	637	629	847	218
	Diverge to 495	596	586	646	60
	Eastern Spur I-95 (Post-ramp)	40	43	201	158
Density (pc/mi/ln)					
Northbound	Bayonne Bridge	7.4	7	11.3	4.3
	RFK Bridge	30.4	30.8	33.2	2.4
	Eastern Spur I-95 (Pre-ramp)	1.9	1.7	2	0.3
	Merge from 495	8.3	8.1	8.3	0.2
	Eastern Spur I-95 (Post-ramp)	6.8	6.5	6.9	0.4
Southbound	Bayonne Bridge	9.8	9.6	10.9	1.3
	RFK Bridge	24.7	25.6	28.9	3.3
	Eastern Spur I-95 (Pre-ramp)	5.4	5.3	7.0	1.7
	Diverge to 495	3	3	3.9	0.9
	Eastern Spur I-95 (Post-ramp)	0.4	0.4	1.5	1.1
Level of Service (LOS)					
Northbound	Bayonne Bridge	A	A	B	—
	RFK Bridge	D	D	D	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Merge from 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—
Southbound	Bayonne Bridge	A	A	A	—
	RFK Bridge	C	C	D	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Diverge to 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—

Source: WSP, 2022.

PM Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 634 vehicles heading into Manhattan or Bronx. This would result in the northbound density along I-278 to increase by approximately 4.5 pc/mi/ln. There would be potential change in LOS from D to E under the analyzed tolling scenario with the highest increase in traffic. However, the speeds would remain about the same at approximately 40 mph or higher and the increase in delay would be small and well below the 2.5-minute threshold.

Traffic in the southbound direction is projected to increase by approximately 612 vehicles heading into Queens. This would result in the southbound density along I-278 to increase by approximately 4.1 pc/mi/ln and the LOS service would remain LOS D. However, the speeds would remain about the same at approximately 40 mph or higher and the increase in delay would be small and well below the 2.5-minute threshold.

Table 4B-25 summarizes the changes in traffic volumes, density, and LOS between existing conditions, the No Action Alternative, and the CBD Tolling Alternative (Tolling Scenario D) for the Bayonne Bridge, RFK Bridge, and I-95 Eastern Spur for the PM time period.

LN Results

With CBD tolling, traffic in the northbound direction is projected to increase by approximately 93 vehicles heading into Manhattan or Bronx. This would result in the northbound density along I-278 to increase by approximately 0.9 pc/mi/ln and the LOS would remain LOS A. Traffic in the southbound direction is projected to increase by approximately 598 vehicles heading into Queens. This would result in the southbound density along I-278 to increase by approximately 3.7 pc/mi/ln and the LOS service would remain at acceptable LOS A. Therefore, there would not be an adverse traffic effect during the LN.

Table 4B-26 summarizes the changes in traffic volumes, density, and LOS between existing conditions, the No Action Alternative, and the CBD Tolling Alternative (Tolling Scenario D) for the Bayonne Bridge, RFK Bridge, and I-95 Eastern Spur for the LN time period.

Table 4B-25. Highway Capacity Software Performance Measures (PM)

DIRECTION	LOCATION	HOURLY VOLUME EXISTING CONDITION	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume					
Northbound	Bayonne Bridge	563	570	783	213
	RFK Bridge	4,710	4,704	5,337	634
	Eastern Spur I-95 (Pre-ramp)	418	436	470	34
	Merge from 495	805	805	851	46
	Eastern Spur I-95 (Post-ramp)	1,223	1,241	1,321	80
Southbound	Bayonne Bridge	791	814	962	148
	RFK Bridge	4,159	4,344	4,957	612
	Eastern Spur I-95 (Pre-ramp)	801	792	847	56
	Diverge to 495	761	755	808	53
	Eastern Spur I-95 (Post-ramp)	40	37	39	3
Density (pc/mi/ln)					
Northbound	Bayonne Bridge	7.8	7.9	10.7	2.8
	RFK Bridge	31.3	31.2	35.7	4.5
	Eastern Spur I-95 (Pre-ramp)	3.1	3.2	3.5	0.3
	Merge from 495	10.4	10.5	10.9	0.4
	Eastern Spur I-95 (Post-ramp)	9.1	9.2	9.7	0.5
Southbound	Bayonne Bridge	11.2	11.6	13.4	1.8
	RFK Bridge	27.9	29.1	33.2	4.1
	Eastern Spur I-95 (Pre-ramp)	5.9	5.9	6.3	0.4
	Diverge to 495	3.4	3.3	3.6	0.3
	Eastern Spur I-95 (Post-ramp)	0.3	0.3	0.3	0
Level of Service (LOS)					
Northbound	Bayonne Bridge	A	A	A	—
	RFK Bridge	D	D	E	X
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Merge from 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—
Southbound	Bayonne Bridge	B	B	B	—
	RFK Bridge	D	D	D	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Diverge to 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—

Source: WSP, 2022.

Table 4B-26. Highway Capacity Software Performance Measures (Late Night)

DIRECTION	LOCATION	HOURLY VOLUME			
		EXISTING CONDITION	NO ACTION ALTERNATIVE	CBD TOLLING ALTERNATIVE (Tolling Scenario D)	INCREMENTAL CHANGE
Hourly Volume					
Northbound	Bayonne Bridge	173	175	228	54
	RFK Bridge	847	866	959	93
	Eastern Spur I-95 (Pre-ramp)	15	16	15	-1
	Merge from 495	341	343	329	-14
	Eastern Spur I-95 (Post-ramp)	356	360	344	-16
Southbound	Bayonne Bridge	207	207	208	1
	RFK Bridge	833	847	1,446	598
	Eastern Spur I-95 (Pre-ramp)	347	354	458	104
	Diverge to 495	334	340	445	105
	Eastern Spur I-95 (Post-ramp)	13	14	13	-1
Density (pc/mi/ln)					
Northbound	Bayonne Bridge	2.6	2.6	3.3	0.7
	RFK Bridge	6.1	6.1	7	0.9
	Eastern Spur I-95 (Pre-ramp)	0.1	0.2	0.1	-0.1
	Merge from 495	4.5	4.5	4.3	-0.2
	Eastern Spur I-95 (Post-ramp)	2.8	2.8	2.6	-0.2
Southbound	Bayonne Bridge	3.3	3.3	3.3	0
	RFK Bridge	5.9	6.3	10.0	3.7
	Eastern Spur I-95 (Pre-ramp)	2.7	2.7	3.5	0.8
	Diverge to 495	1.5	1.5	2	0.5
	Eastern Spur I-95 (Post-ramp)	0.1	0.1	0.1	0
Level of Service (LOS)					
Northbound	Bayonne Bridge	A	A	A	—
	RFK Bridge	A	A	A	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Merge from 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—
Southbound	Bayonne	A	A	A	—
	RFK	A	A	A	—
	Eastern Spur I-95 (Pre-ramp)	A	A	A	—
	Diverge to 495	A	A	A	—
	Eastern Spur I-95 (Post-ramp)	A	A	A	—

Source: WSP, 2022.

SUMMARY OF HIGHWAY ASSESSMENT

Tolling Scenarios A, B, C, and G with the lowest level of discounts, exemptions, and/or crossing credits reduced overall traffic entering and leaving the Manhattan CBD with the least potential effect on travel patterns and diversions. However, VMT would increase slightly in Staten Island and the Bronx due to drivers to and from New Jersey diverting around the Manhattan CBD to avoid paying the CBD toll. Tolling Scenarios D, E, and F, with higher discounts, exemptions and/or crossing credits were found to create the highest overall reduction in traffic entering and leaving the Manhattan CBD, but with higher potential changes in travel patterns and diversions to several highways.

Tolling Scenario D, with higher Manhattan CBD crossing credits and no exemptions and discounts, was determined to have the highest potential for changes in travel patterns and a shift of traffic; therefore, Tolling Scenario D was selected for detailed analysis of potential traffic effects along highway approaches to the Manhattan CBD, along circumferential routes, and at local intersections adjacent to the tunnel portals and bridges crossing into the Manhattan CBD. Potential changes in travel patterns, diversions, and increases in traffic volumes at the affected facilities would fall into a narrow range; therefore, the potential traffic effects are expected to be similar for Tolling Scenarios D, E, and F.

The following four tunnels that cross into the Manhattan CBD have a potential for net increases in traffic due to diversion of traffic:[23]

- The potential shift in traffic to the Lincoln Tunnel for Tolling Scenario D would be offset by a reduction in traffic due to CBD tolling, resulting in a net reduction in traffic. Therefore, the Lincoln Tunnel and NJ Route 495 are expected to have generally reduced traffic and improved traffic operations for all tolling scenarios during the peak hours. Therefore, this facility was not analyzed further because there would not be an adverse effect for any tolling scenario.
- The potential shift in traffic to the Holland Tunnel for Scenario D would be offset by a reduction in traffic due to CBD tolling, resulting in a net reduction in traffic. Therefore, the Holland Tunnel, I-78, and NJ Route 139 are expected to have reduced traffic based on the BPM forecast and improved traffic operations for all tolling scenarios during the peak hours. Therefore, this facility was not analyzed further because there would not be an adverse effect for any tolling scenario.
- The Hugh L. Carey Tunnel is expected to have a net increase in traffic under the tolling scenarios with the largest increases in traffic volumes. A major portion of the increase in traffic in the tunnel is attributable to traffic diverted from the BQE, but overall traffic along the Gowanus Expressway/Prospect Expressway weaving segment leading to the Hugh L. Carey Tunnel and BQE should not increase appreciably. Under Tolling Scenario D, traffic volumes to the Hugh L. Carey Tunnel would increase by 72/486/47 vehicles during the AM, MD, and PM peak hours, respectively. Under the SEQRA criteria, based on a 5 percent increase in traffic under congested conditions and less than a 2.5-minute increase in delay, there would be no adverse effect during the AM and PM peak hours. During the MD peak hour, although the 5 percent increase in traffic would be exceeded, the increase

[23] Only the inbound direction was examined because that is the critical direction due to higher congestion and greater sensitivity to increases (or decreases) in traffic volumes.

in delay would be well below the 2.5-minute threshold and, therefore, there would not be an adverse effect. The Vissim analysis indicates that there would be minimal traffic effects because there would be sufficient reserve capacity in the two inbound lanes of the tunnel to handle the additional traffic volumes during the MD peak hour.

- The Queens-Midtown Tunnel and the Long Island Expressway (I-495) approaches are expected to have a net increase in traffic under the analyzed tolling scenario with the highest increase in traffic associated with crossing credits and a reduction in traffic under all other tolling scenarios. A major portion of the increase in traffic at the Queens-Midtown Tunnel is due to expected diversion of traffic from the Ed Koch Queensboro Bridge, which would be expected to have a net decline in traffic. Under Tolling Scenario D, traffic volumes at the Queens-Midtown Tunnel would increase by 125/383/203 vehicles during the AM, MD, and PM peak hours, respectively, resulting in increased queue lengths and delays for all peak hours. Under the SEQRA criteria, assuming a ***[greater than]*** 5 percent increase ***[in volume]*** under congested conditions and a delay of 2.5 minutes ***[or more]***, there would be a potential adverse effect in the MD peak hour but no anticipated adverse effect during the AM and PM peak hours. Representative of reduced exemptions and crossing credits, Tolling Scenarios A, B, C, and G would provide opportunities for reducing or avoiding potential adverse traffic effects.

All tolling scenarios would increase traffic along two circumferential routes—the Trans-Manhattan/Cross Bronx Expressway via the George Washington Bridge and the Staten Island Expressway (I-278) via the Verrazzano-Narrows Bridge—which would avoid the CBD tolls. In the inbound/eastbound direction, Tolling Scenarios A, B, C, and G would produce the highest diversions while in the outbound/westbound direction, Tolling Scenarios D, E, and F would produce the highest diversions. Overall, the potential diversion of traffic in the westbound direction would be expected to be higher than in the eastbound direction. The circumferential diversion of traffic is expected to have a potential effect on traffic operations along the Trans-Manhattan/Cross Bronx Expressway and, to a much lesser extent, along the Staten Island Expressway (I-278).

- **Staten Island Expressway (I-278):** Under Tolling Scenario D, there would be an increase in traffic volumes westbound on the Verrazzano-Narrows Bridge during the AM, MD, and PM peak hours of 32/201/75 vehicles on the lower level and 64/256/97 vehicles on the upper level, respectively. These increases in traffic are relatively small and would not have an appreciable effect on travel time, delays, speeds, and densities given the available capacity on the Verrazzano-Narrows Bridge. The LOS would remain the same during all time periods for all highway segments operating at LOS B/C during the AM and MD peak hours and LOS E/F during the PM peak hour; therefore, Tolling Scenario D (and Tolling Scenarios E and F), would have no adverse traffic effect along the Verrazzano-Narrows Bridge and the Staten Island Expressway (I-278) during any time period under the SEQRA criteria. Tolling Scenarios A, B, C, and G, with Lower Manhattan CBD tolls, would be expected to create fewer diversions than Tolling Scenarios D, E, and F; therefore, these tolling scenarios would also not result in adverse traffic effects.
- **George Washington Bridge:** Under Tolling Scenario D, there would be an increase in traffic volumes westbound/New Jersey-bound on the George Washington Bridge during the AM, MD, and PM peak hours of 87/826/414 vehicles, respectively. It is anticipated that the increase in traffic volumes would

be within 5 percent during the AM and PM peak hours. During the MD peak hour, it is expected that there would be sufficient capacity to accommodate the additional 826 vehicles given there are two levels on the George Washington Bridge; therefore, an adverse traffic effect under SEQRA *[criteria]* is not anticipated.

- **Trans-Manhattan Expressway:** Under Tolling Scenario D, there would be an increase in traffic volumes westbound/New Jersey-bound on the Trans-Manhattan Expressway during the AM, MD, and PM peak hours of 76/660/313 vehicles. It is anticipated that the increase in traffic volumes would be within 5 percent during the AM and PM peak hours. The increases in traffic volumes during the MD peak hour is expected to exceed 5 percent and there is a potential adverse effect under SEQRA *[criteria]*, depending on the available capacity to handle additional traffic.
- **Cross Bronx Expressway:** Under Tolling Scenario D, there would be an increase in traffic volumes westbound/New Jersey-bound on the Cross Bronx Expressway during the AM, MD, and PM peak hours of 61/200/108 vehicles, respectively. It is anticipated that the increase in traffic volumes would be within 5 percent during the AM and PM peak hours. The increases in traffic volumes during the MD peak hour is expected to exceed 5 percent, and there is a potential adverse effect under SEQRA *[criteria]*, depending on the available capacity to handle additional traffic.
- **FDR Drive/Lower East Side:** The BPM analyses showed a potential 5 to 9 percent increase in daily traffic volumes along the northbound FDR Drive and a 14 to 22 percent increase in daily traffic volumes in the southbound direction in the Lower East Side. Under the SEQRA criteria based on normal traffic fluctuation, there would no adverse effect during the AM and MD peak hours and the additional increment would be absorbed due to the available capacity. During the PM peak hour, these increases in traffic volumes have the potential of creating increased queue lengths and delays during certain peak hours and an anticipated adverse traffic effect under SEQRA *[criteria]*.

In summary, there are potential adverse traffic effects during certain peak hours under the analyzed tolling scenario with the highest increase in traffic along three of the 10 highways analyzed based upon the volume increase criteria used for a preliminary assessment of potential adverse traffic effects under SEQRA along the Long Island Expressway (I-495), the Trans-Manhattan/Cross Bronx Expressway (I-95), and the lower FDR Drive, between East 10th Street and the Brooklyn Bridge.

Adverse effects that would arise if Tolling Scenario D or another similar tolling scenario were implemented will be minimized through implementing Transportation Demand Management measures such as ramp metering, motorist information, signage, and/or targeted toll policy modifications to reduce diversions. The Project Sponsors will undertake monitoring of traffic patterns specifically tailored to the adopted tolling scenario—commencing prior to implementation with data collection approximately three months after the start of Project operations—to determine whether the predicted adverse effects are occurring and to determine the appropriate Transportation Demand Management measures (or improvement in existing Transportation Demand Management measures) to be implemented. The monitoring program will examine changes in traffic volumes, changes in speeds, and changes in delays along the affected highway corridors. Volume changes will be determined from before/after traffic counts (where available); speed changes will be determined from actual before/after speeds based on data provided by StreetLight Data, Inc.; and the

change in delay along major highway corridors will be determined based on actual speeds based on data provided by StreetLight Data, Inc. The monitoring program will inform the development and implementation of appropriate Transportation Demand Management measures and ***[subsequent]*** possible adjustments to the tolling policy should traffic volumes increase by more than 5 percent and delays increase 2.5 minutes ***[or more]***. Although some increases in traffic volumes and travel times are expected along the ***[Trans-Manhattan Expressway, the]*** Long Island Expressway***[, and the lower FDR Drive due to diverted traffic]***, there would be comparable decreases in traffic volumes, travel times and delays for motorists ***[along routes from which traffic diverted. These routes]*** would see a higher reduction in traffic volumes under Tolling Scenario D.

Given the few locations where there is a potential for adverse traffic effects along highways leading to and from the Manhattan CBD and circumferential highways, the offsetting reductions in traffic volumes and improvements in travel times along routes from which traffic would divert, reductions in travel times and delays within the CBD portion of the trip, and the overall Project benefits in the Manhattan CBD and regionally due to a reduction in vehicular travel, the Project when viewed holistically would not have an adverse effect on traffic.

Table 4B-27. Potential Adverse Traffic Effects on Highway Segments – SEQRA

HIGHWAY SEGMENT		TOLLING SCENARIO D		
		AM	MD	PM
Long Island Expressway (I-495)	Leading to the Queens-Midtown Tunnel	No Adverse Effect	SEQRA	No Adverse Effect
George Washington Bridge Approach – Westbound	George Washington Bridge	No Adverse Effect	No Adverse Effect	No Adverse Effect
	Trans-Manhattan Expressway (I-95)*	No Adverse Effect	SEQRA	No Adverse Effect
	Cross Bronx Expressway*	No Adverse Effect	SEQRA	No Adverse Effect
FDR Drive	Northbound Brooklyn Bridge to East 10th Street	No Adverse Effect	No Adverse Effect	SEQRA
	Southbound East 10th Street to the Brooklyn Bridge	No Adverse Effect	No Adverse Effect	SEQRA

Source: WSP, 2022.
Note: SEQRA indicates potential adverse effect under the New York State Environmental Quality Review Act.
* Estimated values

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4B.5 POTENTIAL TRAFFIC EFFECTS ON CENTRAL PARK ROADWAYS

All tolling scenarios would result in overall lower traffic volumes along roadways within and abutting Central Park. Tolling scenarios without crossing credits would have the highest reduction in traffic volumes while tolling scenarios with crossing credits would have lower reductions in traffic volumes. Tolling Scenario F—with all Manhattan crossing credits—was determined to produce the least reduction in traffic volumes within Central Park and surrounding roadways.

Figure 4B-12 shows the percentage change in daily traffic along roadways within Central Park as well as roadways surrounding the park for Tolling Scenario F. All roadways abutting the park—including Central Park West, Fifth Avenue, 110th Street, and 59th Street—are expected to have about 10 percent lower traffic volumes during all time periods. All transverse roadways through the park at 96/97th Streets, 86th Street, 79th Street, Terrace Drive, and 65th Street would also be expected to have lower traffic volumes (about 5 percent to 10 percent less) compared to the No Action Alternative.

Based on an evaluation of the tolling scenario that would result in the highest increase in traffic volumes at certain locations, there would generally be lower traffic along roadways in Central Park and the roadways surrounding the park; therefore, there would not be an adverse traffic effect at Central Park.

Figure 4B-12. Effects of CBD Tolling Alternative on Central Park Traffic

Source: WSP, 2022.

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4B.6 INTERSECTION IMPACT ASSESSMENT

4B.6.1 Methodology[24]

DEFINITION OF STUDY AREAS

To evaluate the potential localized traffic effects of the Project, multiple study areas were defined based on the key entry points to the CBD tolling district, including along the 60th Street Manhattan CBD boundary and on either side of the bridges and tunnels that enter and exit the Manhattan CBD. Figure 4B-13 shows the local study areas or intersection data collection zones identified as focal points for changes in travel patterns with CBD tolling.[25] A total of 102 intersections were identified and were aggregated into 15 study areas. Similar to the highway impacts, many of these study areas were identified through the public outreach process at locations where communities expressed concerns regarding the potential impacts of more local traffic changes. Those intersections are the locations that would most likely experience increases in traffic under the various tolling scenarios, as identified by the BPM. The 15 study areas follow:

- Brooklyn Bridge/Manhattan Bridge–Downtown Brooklyn
- Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan, Brooklyn Bridge, and Manhattan Bridge
- Hugh L. Carey Tunnel–Red Hook
- Holland Tunnel–Jersey City, New Jersey
- Lincoln Tunnel–Manhattan
- Ed Koch Queensboro Bridge–East Side at 60th Street–Manhattan
- West Side at 60th Street–Manhattan
- Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City–Queens
- Queens-Midtown Tunnel–Murray Hill–Manhattan
- Robert F. Kennedy Bridge–Astoria–Queens
- Robert F. Kennedy Bridge–The Bronx
- Robert F. Kennedy Bridge–125th Street–Manhattan
- West Side Highway/Route 9A at West 24th Street–Manhattan
- Lower East Side–Manhattan
- Little Dominican Republic–Manhattan

The local intersections at the New Jersey and Manhattan approaches to the George Washington Bridge and the New Jersey approach to the Lincoln Tunnel were not included because traffic at those intersections connects primarily to regional highways and not local streets.

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24 Detailed methodology is contained in Appendix 4B.1, "Transportation: Transportation and Traffic Methodology for NEPA."

25 Data collection was performed in 2019 prior to the COVID-19 pandemic. Earlier data from 2016 and 2018 from previous studies were used to supplement the data collected in 2019.

Figure 4B-13. Local Intersections and Data Collection Zones

*Broadway & West 179th Street location is located north of illustrated map extent, though demonstrates *No Adverse Impact*

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

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ANALYSIS HOURS

The analysis periods—weekday AM, MD, PM, and LN—were based on the existing peak time periods, which were assumed to be same under the various tolling scenarios. It was assumed that the volume of diverted traffic would be higher during the off-peak periods when Manhattan CBD crossings would be less congested and better able to accommodate diverted traffic. The actual analysis hour was determined by reviewing the highest volumes from the Automatic Traffic Recorder (ATR) counts and transaction data, and through consultation with NYCDOT. **Table 4B-28** shows the peak hours varied by study area based on the available data that does not include LN information at certain locations.

Table 4B-28. Peak Hours by Study Area

STUDY AREA		WEEKDAY AM	WEEKDAY MD	WEEKDAY PM	WEEKDAY LN[1]
1	Downtown Brooklyn	8 to 9	1 to 2	5 to 6	9 to 10
2	Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan	8 to 9	1 to 2	5 to 6	—
3	Hugh L. Carey Tunnel–Red Hook	7:45 to 8:45	12 to 1	4 to 5	9 to 10
4	Holland Tunnel–Jersey City	8 to 9	12 to 1	5 to 6	—
5	Lincoln Tunnel–Manhattan	8 to 9	1 to 2	5 to 6	—
6	East Side at 60th Street–Manhattan	8 to 9	1 to 2	5 to 6	9 to 10
7	West Side at 60th Street–Manhattan	8 to 9	1 to 2	5 to 6	9 to 10
8	Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City	7 to 8	1 to 2	5 to 6	—
9	Queens-Midtown Tunnel–Manhattan	8 to 9	1 to 2	5 to 6	9 to 10
10	Robert F. Kennedy Bridge–Queens	7:15 to 8:15	12:30 to 1:30	4 to 5	9:45 to 10:45
11	Robert F. Kennedy Bridge–The Bronx	8 to 9	1 to 2	5 to 6	9 to 10
12	Robert F. Kennedy Bridge–Manhattan	7:45 to 8:45	1 to 2	4 to 5	9:45 to 10:45
13	West Side Highway/Route 9A at West 24th Street–Manhattan[2]	8 to 9	1 to 2	5 to 6	9 to 10
14	Lower East Side–Manhattan	8 to 9	1 to 2	5 to 6	—
15	Little Dominican Republic–Manhattan	7 to 8	3 to 4	5 to 6	—

Source: WSP analysis of traffic count data, 2019.
1 Late night data not available in some study areas.
2 This location is treated separately because it is between the Hugh L. Carey Tunnel and Holland Tunnel—Lower Manhattan study area and the Lincoln Tunnel—Manhattan study area.

2023 NO ACTION ALTERNATIVE AND CBD TOLLING ALTERNATIVE (TOLLING SCENARIO D) INTERSECTION TRAFFIC VOLUMES

The No Action Alternative intersection traffic volumes were estimated from the BPM results at each intersection for each of the four analysis hours. The No Action Tolling Alternative traffic volumes were estimated for each intersection by adding the 2023 No Action Alternative increment to the 2019 existing traffic volumes to account for changes in the roadway network and intersections already implemented or planned to be implemented by 2023.

Incremental traffic volumes were estimated for Tolling Scenario D[26] at each intersection for each of the four analysis hours from the BPM results.*[[27]]* The 2023 CBD Tolling Alternative traffic volumes were estimated for each intersection by adding the adjusted 2023 increment to the 2023 No Action Alternative traffic volumes to account for changes in the roadway network and geometry changes at intersections already implemented or planned to be implemented by NYCDOT by 2023.

INTERSECTION LEVEL OF SERVICE

Table 4B-29 shows the criteria used to determine intersection LOS for signalized and unsignalized intersections, according to the *Highway Capacity Manual*:[28]

- LOS A, B, and C reflect clearly acceptable traffic conditions.
- LOS D reflects the existence of delays within a generally tolerable range in dense urban environments.
- LOS E and F indicate levels of congestion.

DETERMINING ADVERSE TRAFFIC EFFECTS

For periodic increases in tolling on its bridges, TBTA has historically conducted environmental assessments using SEQRA criteria as a guideline, as well as other considerations, in determining whether a proposed action would result in adverse traffic effects on local intersections.

Under the SEQRA criteria used for many years by NYSDOT and other agencies for projects in the region (including National Environmental Policy Act documents with FHWA as the lead agency such as *Hunts Point Interstate Access Improvement Project EIS* and the *Miller Highway Reconstruction EIS*), an increase threshold of equal to or greater than 10 seconds in average intersection delays at LOS E or LOS F has been used as criteria to determine adverse traffic effects. Several SEQRA analyses by TBTA and other agencies have applied a more conservative criteria of an increase in average intersection delay of greater than 5 seconds at LOS E or LOS F to determine a traffic impact. At LOS D or better, the 5-second threshold could be exceeded if the LOS does not worsen to LOS E or LOS F.

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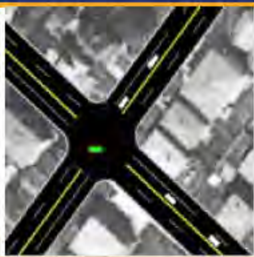
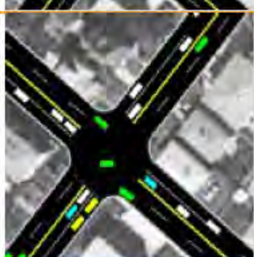
26 An additional traffic analysis was done for the Downtown Brooklyn study area where Tolling Scenario C was determined to be the representative tolling scenario.

[27 For the Final EA, the Project Sponsors committed to additional mitigation measures (see Chapter 16, "Summary of Effects," Table 16-2). These new mitigation commitments neither require a change in the tolling scenarios used for the analyses in the EA nor change the fundamental conclusions of the EA (see Chapter 3, "Environmental Assessment Framework," Section 3.3.3).]

28 *Highway Capacity Manual* (2010)

DOT_0036478

Table 4B-29. Level of Service Average Control Delay Criteria

	LEVEL OF SERVICE	SIGNALIZED INTERSECTIONS AVERAGE CONTROL DELAY (sec/veh)	UNSIGNALIZED INTERSECTIONS AVERAGE CONTROL DELAY (sec/veh)
	A	≤ 10	≤ 10
	B	> 10 and ≤ 20	> 10 and ≤ 15
	C	> 20 and ≤ 35	> 15 and ≤ 25
	D	> 35 and ≤ 55	> 25 and ≤ 35
	E	> 55 and ≤ 80	> 35 and ≤ 50
	F	> 80	> 50

Source: *Highway Capacity Manual.* 2010. Transportation Research Board, National Research Council, Washington DC.

CALIBRATION OF SYNCHRO MODELS

For calibration of Synchro models, NYCDOT provided guidance for intersection performance analysis to reflect prevailing traffic operational conditions based on count data and field observation, including volume and peak-hour factors, parking and curbside lane movements, pedestrian conflicts, and other physical and operational characteristics.

4B.6.2 Affected Environment (including No Action Alternative)

Appendix 4B.2, "Transportation: Traffic Flow Maps" and Appendix 4B.3, "Transportation: Traffic LOS Existing and No Action," presents volume maps and Synchro analysis results for existing conditions and the No Action Alternative for the intersections in the 15 study areas. The following sections summarize the results of the analyses by study area for existing conditions and the No Action Alternative. The No Action Alternative includes known changes that have been or will soon be implemented by NYCDOT, most notably including an additional bicycle lane on the Ed Koch Queensboro Bridge and Brooklyn Bridge, reduction in moving lanes on the BQE between Atlantic Avenue and Sands Street, and updated intersection geometries and signal-timings.

DOWNTOWN BROOKLYN STUDY AREA

In the downtown Brooklyn study area, three intersections were examined:

- AM Peak:
  - During the existing AM peak, 1 intersection operates at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E and 1 intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, 1 intersection operates at LOS E and no intersection operate at LOS F.
  - During the No Action Alternative MD peak, 1 intersection would operate at LOS E and no intersection would operate at LOS F.
- PM Peak:
  - During the existing PM peak, 1 intersection operates at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative PM peak, 1 intersection would operate at LOS E and no intersection would operates at LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F

HUGH L. CAREY TUNNEL AND HOLLAND TUNNEL–LOWER MANHATTAN STUDY AREA

In the Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan study area, the analysis included 15 intersections:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, 2 intersections would operate at LOS E and no intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E and 1 intersection operates at LOS F.
  - During the No Action Alternative PM peak, 1 intersection would operate at LOS E and 1 intersection would operate at LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based on lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

HUGH L. CAREY TUNNEL–RED HOOK STUDY AREA

In the Hugh L. Carey Tunnel–Red Hook study area, the analysis included two intersections:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

HOLLAND TUNNEL–JERSEY CITY STUDY AREA

In the Holland Tunnel–Jersey City study area, 4 intersections were examined:

- AM Peak:
  - During the existing AM peak, 2 intersections operate at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative AM peak, 2 intersections would operate at LOS E and 1 intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, 2 intersections operate at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative PM peak, 3 intersections would operate at LOS E and no intersection would operate at LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based on lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

LINCOLN TUNNEL–MANHATTAN STUDY AREA

In the Lincoln Tunnel–Manhattan study area, 9 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based on lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

EAST SIDE AT 60TH STREET–MANHATTAN STUDY AREA

In the East Side at 60th Street–Manhattan study area, 17 signalized intersections and 2 unsignalized intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, 1 intersection would operate at LOS E and no intersection would operates at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, 1 intersection would operate at LOS E and no intersection would operates at LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

WEST SIDE AT 60TH STREET–MANHATTAN STUDY AREA

In the West Side at 60th Street–Manhattan study area, 19 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, 1 intersection operates at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative MD peak, 1 intersection would operate at LOS E and no intersection would operate at LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

QUEENS-MIDTOWN TUNNEL–MANHATTAN STUDY AREA

In the Queens-Midtown Tunnel–Manhattan study area, 6 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E and 1 intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E and 1 intersection would operate at LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

QUEENS-MIDTOWN TUNNEL/ED KOCH QUEENSBORO BRIDGE–LONG ISLAND CITY STUDY AREA

In the Queens-Midtown Tunnel–Long Island City study area, 13 intersections were examined, including 4 unsignalized intersections:

- AM Peak:
  - During the existing AM peak, 2 intersections operate at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative AM peak, 2 intersections would operate at LOS E and no intersection would operate at LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, 1 intersection operates at LOS E and no intersection operates at LOS F.
  - During the No Action Alternative PM peak, 3 intersections would operate at LOS E and no intersection would operate at LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based upon the lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

RFK BRIDGE–QUEENS STUDY AREA

In the RFK Bridge–Queens study area, 3 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E and 1 intersection operates at LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E and 1 intersection would operate at LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

RFK BRIDGE–BRONX STUDY AREA

In the RFK Bridge–Bronx study area, 2 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the projected No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

RFK BRIDGE–MANHATTAN STUDY AREA

In the RFK Bridge–Manhattan study area, 2 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

WEST SIDE HIGHWAY/ROUTE 9A AT WEST 24TH STREET–MANHATTAN STUDY AREA

In the West Side Highway/Route 9A at West 24th Street–Manhattan study area,[29] only 1 intersection was examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - During the existing LN peak, no intersection operates at LOS E or LOS F.
  - During the projected No Action Alternative LN peak, no intersection would operate at LOS E or LOS F.

[29] This location is treated separately because it is between the Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan Study Area and the Lincoln Tunnel–Manhattan study area.

LOWER EAST SIDE–MANHATTAN STUDY AREA

In the Lower East Side study area, 3 intersections were examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing MD peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing PM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based upon the lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

LITTLE DOMINICAN REPUBLIC–MANHATTAN STUDY AREA

In the Little Dominican Republic–Manhattan study area, 1 intersection was examined:

- AM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative AM peak, no intersection would operate at LOS E or LOS F.
- MD Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative MD peak, no intersection would operate at LOS E or LOS F.
- PM Peak:
  - During the existing AM peak, no intersection operates at LOS E or LOS F.
  - During the No Action Alternative PM peak, no intersection would operate at LOS E or LOS F.
- LN Peak:
  - The Synchro model for these intersections did not include LN data and based upon the lower overall nighttime existing conditions and No Action Alternative volumes, no further evaluation was warranted.

4B.6.3 Environmental Consequences

POTENTIAL TRAFFIC EFFECTS AT INTERSECTIONS

Based on the BPM analysis, Tolling Scenario D was identified as having the most number of intersection locations with a potential increase of 50 or more vehicles. Therefore, all 102 intersections were analyzed for Tolling Scenario D. An additional analysis was performed in the Downtown Brooklyn study area for Tolling Scenario C since that tolling scenario produced a larger number of intersections with an increase of 50 or more vehicles.

The Synchro model was used to analyze the No Action Alternative and CBD Tolling Alternative at each intersection during the AM, MD, PM and LN peak hours.[30] The change in average intersection delays was used to assess potential traffic effects. TBTA adopted an increase of more than 5 seconds average intersection delay at LOS E or F as the criteria for determining the significance of traffic effects under SEQRA. Increases in intersection delays greater than 5 seconds are not considered an adverse effect if the resulting LOS is D or better.

Table 4B-30 summarizes the results of the intersection analyses identifying those intersections where the SEQRA criteria used by TBTA of more than 5 seconds increase in delay would be exceeded. Potential adverse traffic effects were identified at a total of 4 intersections out of 102 intersections analyzed during one or more peak hours. Signal-timing improvements would mitigate any potential adverse traffic effects at all locations.

Table 4B-30. Potential Traffic Effects at Intersections With and Without Signal-Timing Improvements

TOLLING SCENARIO D STUDY AREA	INTERSECTION NAME	ANALYSIS PERIOD	WITHOUT IMPROVEMENTS SEQRA Impact?	WITH IMPROVEMENTS SEQRA Impact?
Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan	Trinity Place and Edgar Street	MD	Yes	No
Queens-Midtown Tunnel–Manhattan	East 36th Street and Second Avenue	MD	Yes	No
	East 37th Street and Third Avenue	LN	Yes	No
Robert F. Kennedy Bridge–Manhattan	East 125th Street and Second Avenue	AM	Yes	No
		PM	Yes	No

Source: WSP, 2022.
Note: Results of analysis for all intersections can be found in **Appendix 4B.5, "Transportation: Traffic LOS, CBD Tolling Alternative with Mitigation."**

DOWNTOWN BROOKLYN STUDY AREA

A detailed traffic analysis was performed at three intersections within this study area. The results of the analysis for the AM, MD, and PM peak hours, showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an

30 Pre-COVID-19-pandemic intersection counts were available at only 64 of the 102 intersections analyzed during the LN peak.

adverse traffic effect; therefore, there would not be an adverse traffic impact in the Downtown Brooklyn study area.

HUGH L. CAREY TUNNEL AND HOLLAND TUNNEL–LOWER MANHATTAN STUDY AREA

A detailed traffic analysis was performed at 15 intersections within this study area. The results of the analysis for the AM, MD, and PM peak hours, without and with traffic signal-timing improvements, are described below at the potentially affected locations.

Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan Study Area—Without Signal-Timing Improvements

AM PEAK HOUR (8:00 a.m. to 9:00 a.m.)

No intersections with an increase in delay would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the AM peak hour; therefore, there would not be an adverse traffic impact during the AM peak hour.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

One intersection would have a potential increase in delays that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect as described below:

- SEQRA Impacts:
  - **Trinity Place (NB-SB) and Edgar Street (EB):** Under the No Action Alternative, this intersection would operate at LOS C, with an overall intersection delay of 24.7 seconds. With the CBD Tolling Alternative, the overall intersection delay would increase by 65.5 seconds to 90.2 seconds, due to the addition of 98 vehicles to the intersection. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect the increase in average intersection delay would exceed the allowable increase in delay.

PM PEAK HOUR (5:00 p.m. to 6:00 p.m.)

No intersections with an increase in delay would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the PM peak hour; therefore, there would not be an adverse traffic effect during the PM peak hour.

Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan Study Area—With Signal-Timing Improvements

With traffic signal-timing improvements no intersections would have potential increases in delay that exceed the SEQRA threshold used to determine whether there would be an adverse traffic effect.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

- SEQRA Impacts:
  - **Trinity Place (NB–SB) and Edgar Street (EB):** With signal retiming, this intersection would operate at LOS C with a delay of 32.4 seconds, which would be 7.7 seconds greater than the No Action Alternative. This would result in a delay increase below the *SEQRA* threshold and there would be no adverse effect.

HUGH L. CAREY TUNNEL–RED HOOK STUDY AREA

A detailed traffic analysis was performed at two intersections within this study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect in the Hugh L. Carey Tunnel—Red Hook study area.

HOLLAND TUNNEL–JERSEY CITY, NEW JERSEY, STUDY AREA

A detailed traffic analysis was performed at four intersections within this study area. The results of the analysis for the AM, MD, and PM peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA criteria used by TBTA.

LINCOLN TUNNEL–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at nine intersections within the study area. The results of the analysis for the AM, MD, and PM peak hours showed that none of the intersections had an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the Lincoln Tunnel—Manhattan study area.

EAST SIDE AT 60TH STREET–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at 19 intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the East Side 60th Street—Manhattan study area.

WEST SIDE AT 60TH STREET–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at 19 intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the West Side 60th Street - Manhattan study area.

QUEENS-MIDTOWN TUNNEL–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at six intersections within the study area. The results of the analysis for the AM, MD, PM, and LN peak hours, with and without traffic signal-timing improvements, are described below at the potentially affected locations.

Queens-Midtown Tunnel–Manhattan—Without Signal-Timing Improvements

AM PEAK HOUR (8:00 a.m. to 9:00 a.m.)

No intersections had an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the AM peak hour; therefore, there would not be an adverse traffic impact during the AM peak hour.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

One intersection would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect. The exceedances are described below:

- SEQRA Impacts:
  - **East 36th Street (EB) and Second Avenue (SB):** This intersection would operate at LOS F, with an overall intersection delay of 106.1 seconds, under the No Action Alternative. With the CBD Tolling Alternative, the overall intersection delay would increase by 15 seconds to 121.1 seconds, due to the addition of 16 vehicles to the intersection. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect, the increase in delay would exceed the maximum allowable increase in delay.

PM PEAK HOUR (5:00 p.m. to 6:00 p.m.)

No intersections had an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the PM peak hour; therefore, there would not be an adverse traffic impact during the PM peak hour.

LN PEAK HOUR (9:00 p.m. to 10:00 p.m.)

One intersection would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect. The exceedances are described below:

- SEQRA Impacts:
  - **East 37th Street (WB) and Third Avenue (NB):** This intersection would operate at LOS C, with an overall intersection delay of 21.8 seconds, under the No Action Alternative. With the CBD Tolling Alternative, the overall intersection delay would increase by 41.1 seconds to 62.9 seconds, due to the addition of 62 vehicles to the intersection. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect, the increase in delay would exceed the maximum allowable increase in delay.

Queens-Midtown Tunnel–Manhattan Study Area—With Signal-Timing Improvements

With traffic signal-timing improvements no intersections would have potential increases in delay that exceed the SEQRA threshold used to determine whether there would be an adverse traffic effect.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

- SEQRA Impacts:
  - East 36th Street (EB) and Second Avenue (SB): With signal retiming, this intersection would operate at LOS F with a delay of 109.7 seconds, which would be 3.6 seconds greater than the No Action Alternative. This would result in a delay increase below the SEQRA threshold and there would be no adverse effect.

LN PEAK HOUR (9:00 p.m. to 10:00 p.m.)

- SEQRA Impacts:
  - East 37th Street (WB) and Third Avenue (NB): With signal retiming, this intersection would operate at LOS C with a delay of 26.5 seconds, which would be 4.7 seconds greater than the No Action Alternative. This would result in a delay increase below the SEQRA threshold and there would be no adverse effect.

QUEENS-MIDTOWN TUNNEL/ED KOCH QUEENSBORO BRIDGE–LONG ISLAND CITY STUDY AREA

A detailed traffic analysis was performed at 13 intersections in this study area. The results of the analysis for the AM, MD, and PM peak hours showed that none of the intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City study area.

RFK BRIDGE–QUEENS STUDY AREA

A detailed traffic analysis was performed at three intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the RFK Bridge–Queens study area.

RFK BRIDGE–BRONX STUDY AREA

A detailed traffic analysis was performed at two intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the RFK Bridge–*[Bronx]* study area.

RFK BRIDGE–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at two intersections in the study area. The results of the analysis for the AM, MD, PM, and LN peak hours, without and with traffic signal-timing improvements, are described below at the potentially affected locations.

RFK Bridge–Manhattan Study Area—Without Signal-Timing Improvements

AM PEAK HOUR (8:00 a.m. to 9:00 a.m.)

One intersection would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the AM peak hour. All exceedances are described below:

- SEQRA Impacts:
  - East 125th Street (EB–WB), Second Avenue (SB), RFK Bridge Exit (SW): This intersection would operate at LOS C, with an overall intersection delay of 34.9 seconds, under the No Action Alternative. With the CBD Tolling Alternative, the overall intersection delay would increase by

20.4 seconds to 55.3 seconds, due to the addition of 17 vehicles to the intersection. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect, the increase in delay would exceed the maximum allowable increase in delay.

MD PEAK HOUR (1:00 p.m. to 2:00 p.m.)

No intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the MD peak hour.

PM PEAK HOUR (5:00 p.m. to 6:00 p.m.)

One intersection would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the PM peak hour. All exceedances are described below:

- SEQRA Impacts:
  - **East 125th Street (EB–WB), Second Avenue (SB), RFK Bridge Exit (SW)—Southwest-bound Left:** This intersection would operate at LOS C, with an overall intersection delay of 25 seconds, under the No Action Alternative. With the CBD Tolling Alternative, the overall intersection delay would increase by 52.2 seconds to 77.2 seconds, due to the additional vehicles to specific lane groups. Under the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect, the increase in delay would exceed the maximum allowable increase in delay.

LN PEAK HOUR (9:45 p.m. to 10:45 p.m.)

No intersections would have an increase in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect during the LN peak hour.

RFK Bridge–Manhattan Study Area—With Signal-Timing Improvements

With signal-timing improvements in place, no intersections would have potential increases in delay that would exceed the SEQR threshold.

AM PEAK HOUR (8:00 a.m. to 9:00 a.m.)

- SEQRA Impacts:
  - **East 125th Street (EB-WB), Second Avenue (SB), RFK Bridge Exit (SW):** With signal retiming, this intersection would operate at LOS D with a delay of 37.8 seconds, which would be 2.9 seconds greater than the No Action Alternative. This would result in a delay increase below the SEQRA threshold and there would be no adverse effect.

PM PEAK HOUR (5:00 p.m. to 6:00 p.m.)

- SEQRA Impacts:
  - **East 125th Street (EB–WB), Second Avenue (SB), RFK Bridge Exit (SW):** With signal retiming, this intersection would operate at LOS D with a delay of 36.2 seconds, which would be 11.2 seconds greater than the No Action Alternative. This would result in a LOS improvement that does not exceed the SEQRA threshold and there would be no adverse effect.

WEST SIDE HIGHWAY/ROUTE 9A AT WEST 24TH STREET–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at one intersection in the study area.[31] The results of the analysis for the AM, MD, PM, and LN peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact at this location.

LOWER EAST SIDE–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at three intersections in the study area. The results of the analysis for the AM, MD, and PM peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact in the Lower East Side study area.

LITTLE DOMINICAN REPUBLIC–MANHATTAN STUDY AREA

A detailed traffic analysis was performed at one intersection in the study area. The results of the analysis for the AM, MD, and PM peak hours showed that no intersections would have potential increases in delay that would exceed the SEQRA threshold used by TBTA to determine whether there would be an adverse traffic effect; therefore, there would not be an adverse traffic impact at this location.

4B.6.4 Summary of Local Intersection Performance for Scenario(s) with Highest Increase in Traffic

A total of 102 intersections were analyzed during the AM, MD, PM, and, as applicable, LN peak hours in 15 study areas. These study areas and intersections were chosen for analysis based upon the likelihood of potential traffic increases and impacts.

Table 4B-31 presents a summary of the number of analyzed signalized intersections that would be expected to have an increase, decrease, or no change in delay under the analyzed tolling scenario with the highest increase in traffic volumes. The results indicate that most intersections would see reductions in delay or there would be no change in delay while there would be 73 instances (about 20 percent of all analyses) where the delay would increase. Prior to mitigation, 5 locations (about 1 percent of all analyses) would exceed the SEQRA thresholds. Table 4B-31 shows there would be no locations where changes in delay would create adverse effects based on the SEQRA criteria of greater than a 5-second increase in average delay that could not be addressed by incorporating signal-timing improvements into the Project. Under SEQRA (thresholds used by state agencies[32]), the criteria used for determining the significance of adverse traffic effects at intersections generally varies from an increase in delay of 5 to 10 seconds per vehicle at a

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31 This location is treated separately because it is between the Hugh L. Carey and Holland Tunnel–Lower Manhattan study area and the Lincoln Tunnel–Manhattan study area.

32 *Miller Highway Reconstruction EIS* (NYSDOT 1993) used a criteria of 10 seconds or more increase in average intersection delay per vehicle at LOS E/F.
Hunts Point Access Improvements EIS (NYSDOT 2019) used a criteria of 10 seconds or more increase in delay per vehicle and a deterioration in LOS to E/F.
Fulton Street Transit Center EIS (MTA 2004) used a criteria of 10 seconds or more increase in average vehicle delay at LOS E/F.
Toll Policy EAs (TBTA 2005–2021) used a criteria of greater than a 5 second increase in average vehicle delay at LOS E/F.
Long Island Jewish Medical Center Modernization Program Final Generic EIS (Dormitory Authority of the State of New York 2009) used a criteria of greater than a 5 second increase in average intersection approach delay at LOS E/F.

deteriorated LOS E or LOS F. Increases in average delays at intersections resulting in LOS D or better are not considered significant.

Table 4B-31. Summary of Local Intersection Performance With Improvements

STUDY AREA	INTERSECTIONS	TOTAL COUNT	DELAY CHANGE (COUNT)			IMPACT COUNT (SEQRA)
			Increase	Decrease	No Change	
Downtown Brooklyn*	Signalized Intersections	12	3	9	0	0
Hugh L. Carey Tunnel and Holland Tunnel–Lower Manhattan	Signalized Intersections	45	16	28	1	0
Hugh L. Carey Tunnel–Red Hook	Signalized Intersections	8	4	3	1	0
Holland Tunnel–New Jersey**	Signalized Intersections	12	0	12	0	0
Lincoln Tunnel–Manhattan	Signalized Intersections	27	1	26	0	0
East Side at 60th Street–Manhattan	Signalized Intersections	76	7	61	8	0
West Side at 60th Street–Manhattan	Signalized Intersections	76	9	66	1	0
Queens-Midtown Tunnel–Manhattan	Signalized Intersections	24	8	15	1	0
Queens-Midtown Tunnel/Ed Koch Queensboro Bridge–Long Island City	Signalized Intersections	39	9	19	11	0
Robert F. Kennedy Bridge***	Signalized Intersections	28	9	10	9	0
West Side Highway/ Route 9A at West 24th Street	Signalized Intersections	4	0	4	0	0
Lower East Side–Manhattan	Signalized Intersections	9	4	5	0	0
Little Dominican Republic–Manhattan	Signalized Intersections	3	3	0	0	0
TOTAL	**Signalized Intersections**	**363**	**73**	**258**	**32**	**0**

Source: WSP, 2022.
Note: Numbers may not add up due to rounding.
* The Downtown Brooklyn study area was also analyzed for Tolling Scenario C, which was projected to have higher increases in traffic volumes than Tolling Scenario D. The results from Tolling Scenario C analysis are shown for Downtown Brooklyn study area.
** New Jersey locations are outside the jurisdiction of SEQRA.
*** RFK Bridge consists of the RFK–Queens, RFK–Bronx, and RFK–Manhattan study areas.

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In summary, based upon the analysis of potential changes in traffic patterns, including reductions in traffic volumes and diversions associated with the range of tolling scenarios, the overall change in LOS and delay at the 102 intersections analyzed would be modest. Figure 4B-14 through Figure 4B-17 present the study area intersections and summarize the potential effects of the Project with and without signal-timing improvements. There were four intersections (with a total of five instances) where the incremental traffic volumes would result in potential adverse effects using the SEQRA criteria with increases in average intersection delays exceeding 5 seconds without the implementation of standard traffic signal-timing improvements.

Based on a detailed traffic analysis during the AM, MD, PM, and LN peak hours at 102 key intersections most likely to experience increases in traffic volumes and delays under Tolling Scenario D with the largest increases in local traffic volumes, there would be only minor traffic effects, which can be addressed by incorporating signal-timing adjustments.[33] Similar minor traffic effects are not anticipated for Tolling Scenarios A, B, C, or G. It is expected that, with *[NYCDOT's]* commitment to monitor traffic conditions under all tolling scenarios, and make appropriate signal-timing changes if necessary, there would be no anticipated adverse effects from implementing the Project for any of the tolling scenarios when considering the SEQRA criteria for determining potential adverse traffic effects.

The Project Sponsors will undertake pre- and post-implementation monitoring at the four intersections with identified potential adverse effects *[within the six months prior to]* implementation of the Project, with post-implementation monitoring *[within the six months after]* the start of operations. The monitoring would be used to validate the need for, and design of, potential mitigation *[measures]*. In line with the SEQRA criteria, the threshold for determining whether there is an adverse effect is an increase in average intersection delays exceeding 5 seconds *[at LOS E/F]*, as described above. The Project Sponsor commits to using a toolbox of traffic operations and street design strategies (e.g., signal-timing/phasing changes, lane assignment changes, changes to curbside regulations, etc.) to mitigate adverse effects associated with the adopted tolling scenario, to the extent practicable. In addition, the robust post-implementation biennial Evaluation Report mandated by the Traffic Mobility Act will include traffic data collection at intersections in and around the Manhattan CBD and other locations of interest in the form of ATR and camera-based Vehicle Classification and Turning Movement Counts. These data will be used to identify and quantify actual traffic effects associated with the adopted tolling scenario and to inform the development of appropriate mitigation measures, if needed. Depending upon the tolling scenario selected and future unforeseen operational and geometric changes at certain intersections, it is possible that some residual traffic effects at those intersections may remain.

33 Appropriate signal-timing improvement measures would be undertaken post-implementation. The signal-timing improvements described in this document represent what may need to be done under the analyzed tolling scenario, but because the tolling scenario is to be determined by the Traffic Mobility Review Board, the actual scope and need for signal-timing improvements may change. The Project Sponsors would monitor traffic conditions at the study locations and NYCDOT would implement appropriate signal-timing changes if adverse effects are observed.

Figure 4B-14. Potential Adverse Traffic Effects at Local Intersections AM Period

*Broadway & West 179th Street location is located north of illustrated map extent, though demonstrates *No Adverse Impact*

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Figure 4B-15. Potential Adverse Traffic Effects at Local Intersections MD Period

*Broadway & West 179th Street location is located north of illustrated map extent, though demonstrates No Adverse Impact

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

Figure 4B-16. Potential Adverse Traffic Effects at Local Intersections PM Period

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

DOT_0036499

Figure 4B-17. Potential Adverse Traffic Effects at Local Intersections Late Night (LN) Period

Source: ESRI, NYC Open Data, NYMTC 2020 TransCAD Highway Network.

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4B.7 CONCLUSION

Chapter 1, "Introduction," succinctly describes the level of congestion experienced by travelers to the Manhattan CBD. The low travel speeds and unreliable travel times to, from, and within the Manhattan CBD increase auto commute times, erode worker productivity, reduce bus and paratransit service quality, raise the cost of deliveries and the overall cost of doing business, and delay emergency vehicles. A 2018 analysis by Partnership for New York City—an organization that represents the city's business leadership and largest private-sector employers—predicted that congestion in the New York City region would cost businesses, commuters, and residents $100 billion over the next 5 years.[34] Thus, there is a need to reduce vehicle congestion in the Manhattan CBD to improve the reliability and efficiency of the transportation system.

In general, the Project would reduce traffic at key Manhattan CBD crossings, the approach roadways, and at intersections within the Manhattan CBD as well as intersections outside of the Manhattan CBD. However, under certain tolling scenarios, where crossings credits would be applied at currently tolled facilities, there is a potential of traffic diversion to facilities offering a toll credit. In some locations, this is beneficial as it can aid in addressing traffic imbalances already in place as certain drivers take longer routes to avoid tolls (notably at the East River Bridges). However, by raising the overall toll these same crossing credits can cause potential for circumferential diversions, leading to increased traffic at the Verrazzano-Narrows Bridge and the George Washington Bridge for through Manhattan CBD trips between Brooklyn, Queens, and Long Island and points in New Jersey or west.

Highway corridors and intersections determined to be potentially affected by CBD tolling were identified based upon modeling runs using the regional BPM for all tolling scenarios, consultation with NYCDOT and NYSDOT, and review of previous tolling studies.

Tolling Scenario D—with the highest crossing credits, exemptions, and discounts—was determined to be representative of the tolling scenarios with the highest potential for diversions and increases in traffic at certain Manhattan CBD crossings, Manhattan CBD highway approaches, intersections within and outside of the Manhattan CBD, and circumferential routes bypassing the Manhattan CBD. Therefore, detailed traffic analyses were performed for Tolling Scenario D. In a few cases, additional traffic analyses were performed for other tolling scenarios at specific locations where the projected increases in traffic volumes were higher.

[Table 4B-32 summarizes the potential traffic-related effects of the CBD Tolling Alternative, and Table 4B-33 summarizes how mitigation measures will be implemented by the Project Sponsors.]

HIGHWAY ANALYSIS

A total of 10 highway corridors were identified within the 28-county New York/New Jersey metropolitan area with a potential for increased traffic and adverse effects using the BPM to screen highways with

34 Partnership for New York City. January 2018. *$100 Billion Cost of Traffic Congestion in Metro New York*. https://pfnyc.org/wp-content/uploads/2018/01/2018-01-Congestion-Pricing.pdf. The report defined the New York City region as New York, Kings, Queens, Bronx, Richmond, Nassau, Suffolk, Westchester, Putnam, and Rockland Counties, New York.

potential adverse effects for all tolling scenarios. These 10 highway corridors were analyzed using a Vissim microsimulation model, the HCS, or applying a speed and volume increase criteria where a traffic model and/or reliable pre-COVID19-pandemic traffic data were not available.

Although the overall effects of the CBD Tolling Alternative along highways used to access the Manhattan CBD would be beneficial for all tolling scenarios, potential adverse traffic effects along 3 of the 10 highway corridors analyzed were identified under some of the tolling scenarios during certain time periods as described below:

- Trans-Manhattan/Cross Bronx Expressway—westbound during the MD peak hour
- Long Island Expressway—westbound during the MD peak hour
- FDR Drive between East 10th Street and Brooklyn Bridge—northbound and southbound during the PM peak hour

Given the few locations where there is a potential for adverse traffic effects along highways leading to and from the Manhattan CBD and circumferential highways, the offsetting reductions in traffic volumes and improvements in travel times along routes from which traffic would divert, and the overall Project benefits in the Manhattan CBD and regionally due to a reduction in vehicular travel, the Project when viewed holistically would not have an adverse effect on traffic along the highway corridors used to access the Manhattan CBD and along circumferential routes.

Adverse effects ***[along highways]*** that would arise if Tolling Scenario D or another similar tolling scenario were implemented will be minimized through implementing Transportation Demand Management measures such as ramp metering, motorist information, signage, signal timing changes, and/or targeted toll policy modifications to reduce diversions. The Project Sponsors will undertake monitoring of traffic patterns specifically tailored to the adopted tolling scenario—commencing prior to implementation (to establish a baseline), with data collection approximately 3 months after the start of project operations—to determine whether the predicted adverse effects are occurring and to determine the appropriate Transportation Demand Management measures (or improvement in existing Transportation Demand Management measures) to be implemented. The monitoring program will examine changes in traffic volumes, changes in speeds, and changes in delays along the affected highway corridors. Volume changes will be determined from before/after traffic counts (where available); speed changes will be determined from actual before/after speeds based on data provided by StreetLight Data, Inc.; and the change in delay along major highway corridors will be determined based on actual speeds based on data provided by StreetLight Data, Inc. The monitoring program will inform the development and implementation of appropriate Transportation Demand Management measures and ***[subsequent]*** possible adjustments to the tolling policy should traffic volumes increase by more than 5 percent and delays increase ***[by]*** 2.5 minutes ***[or more]***.

INTERSECTION ANALYSIS

A total of 102 intersections were analyzed for the tolling scenarios with the largest increase in traffic applicable to each of the 15 study areas during the AM, MD, PM, and LN hours. These intersections were selected for analysis based on an evaluation of potential highway diversions as described above.

Most intersections would experience a decrease in traffic volumes and delays under all tolling scenarios. However, under the analyzed tolling scenarios, there would be increases in average delays at 4 of the 102 intersections analyzed that would exceed the greater-than-5-second threshold at LOS E/F used for determining adverse traffic effects under SEQRA. Signal-timing adjustments would reduce the projected increase in delays below the threshold or improve the LOS to D or better. Therefore, standard mitigation measures would avoid adverse traffic effects that could result from the CBD Tolling Alternative.

The robust post-implementation biennial Evaluation Report mandated by the Traffic Mobility Act will include traffic data collection at intersections in and around the Manhattan CBD and other locations of interest in the form of ATR and camera-based Vehicle Classification and Turning Movement Counts. These data will be used to identify and quantify actual traffic effects associated with the adopted tolling scenario. If any unforeseen adverse effects on traffic at local intersections are observed, appropriate signal timing mitigation measures will be developed and implemented consistent with NYCDOT policy.

Table 4B-32. Summary of Effects of the CBD Tolling Alternative on Highways and Local Intersections

TOPIC	SUMMARY OF EFFECTS	LOCATION	DATA SHOWN IN TABLE	TOLLING SCENARIO A	B	C	D	E	F	G	POTENTIAL ADVERSE EFFECT	MITIGATION AND ENHANCEMENTS
Traffic – Highway Segments	The introduction of the CBD Tolling Program may produce increased congestion on highway segments approaching on circumferential roadways used to avoid Manhattan CBD tolls, resulting in increased delays and queues in midday and PM peak hours on certain segments in some tolling scenarios: ▪ Westbound Long Island Expressway (I-495) near the Queens-Midtown Tunnel (midday) ▪ Approaches to westbound George Washington Bridge on I-95 (midday) ▪ Southbound and northbound FDR Drive between East 10th Street and Brooklyn Bridge (PM) ▪ Other locations will see an associated decrease in congestion particularly on routes approaching the Manhattan CBD.	10 highway segments (AM)	Highway segments with increased delays and queues in peak hours that would result in adverse effects	0 out of 10 highway corridors in the analyzed tolling scenario (Tolling Scenario D)							Yes	**Mitigation needed.** The Project Sponsors will implement a monitoring plan prior to implementation with post-implementation data collected approximately three months after the start of ***[tolling]*** operations and including thresholds for effects; if the thresholds are reached or crossed, the Project Sponsors will implement Transportation Demand Management (TDM) measures, such as ramp metering, motorist information, signage at all identified highway locations with adverse effects upon implementation of the Project. ***[NYSDOT owns and maintains the relevant segments of the Long Island Expressway and I-95. The relevant segment of the FDR Drive is owned by NYSDOT south of Montgomery Street and NYCDOT north of Montgomery Street. Implementation of TDM measures will be coordinated between the highway owners and the owners of any assets relevant to implementing the TDM.]*** Post-implementation ***[of TDM measures]***, the Project Sponsors will monitor effects and, if needed, TBTA will modify the toll rates, crossing credits, exemptions, and/or discounts ***[within the parameters of the adopted toll schedule]*** to reduce adverse effects.
		10 highway segments (midday)		2 out of 10 highway corridors in the analyzed tolling scenario (Tolling Scenario D), as well as Tolling Scenarios E and F								
		10 highway segments (PM)		1 out of 10 highway corridors in the analyzed tolling scenario (Tolling Scenario D), as well as Tolling Scenarios E and F								
Intersections	Shifts in traffic patterns, with increases in traffic at some locations and decreases at other locations, would change conditions at some local intersections within and near the Manhattan CBD. Of the 102 intersections analyzed, most intersections would see reductions in delay.	**363 locations (All day)**	Number of instances of intersections with an increase in volumes of 50 or more vehicles in the peak hours.	**9**	**10**	**24**	**50**	**48**	**50**	**10**	Yes	**Mitigation needed.** ***[NYCDOT]*** will monitor those intersections where ***[potential]*** adverse effects were identified and implement appropriate signal timing adjustments to mitigate the effect, per NYCDOT's normal practice. **Enhancement** Refer to the overall Project enhancement on monitoring at the end of this table.
		102 locations (AM)		2	2	3	3	3	3	2		
		102 locations (midday)		1	2	4	16	16	17	0		
		102 locations (PM)		1	1	1	10	9	9	1		
		57 locations (overnight)		5	5	16	21	20	21	5		
	Potential adverse effects on four local intersections in Manhattan: Trinity Place and Edgar Street (midday); East 36th Street and Second Avenue (midday); East 37th Street and Third Avenue (midday); East 125th Street and Second Avenue (AM, PM)	4 locations	Locations with potential adverse effects that ***[will]*** be addressed with signal timing adjustments	0	0	0	4	4	4	0		

OVERALL PROJECT ENHANCEMENT. The Project Sponsors commit to ongoing monitoring and reporting of potential effects of the Project, including for example, traffic entering the Manhattan CBD, taxi/FHV vehicle-miles traveled in the Manhattan CBD; transit ridership from providers across the region; bus speeds within the Manhattan CBD; air quality and emissions trends; parking; and Project revenue. Data will be collected in advance and after implementation of the Project. A formal report on the effects of the Project will be issued one year after implementation and then every two years. In addition, a reporting website will make data, analysis, and visualizations available in open data format to the greatest extent ***[practicable]***. Updates will be provided on at least a bi-annual basis as data becomes available and analysis is completed.

[Table 4B-33. Summary of the CBD Tolling Alternative Implementation Approach for Mitigation and Enhancement Measures for Highways and Local Intersections]

TOPIC	RELEVANT LOCATION(S)	DESCRIPTION OF MITIGATION OR ENHANCEMENT	TIMELINE FOR PRE- AND POST-PROJECT IMPLEMENTATION DATA COLLECTION FOR SPECIFIC MEASURES	THRESHOLD FOR DETERMINING WHEN NEXT STEP(S) WILL BE IMPLEMENTED	TIMING FOR SPECIFIC MEASURES	LEAD AGENCY
Traffic – Highway Segments	Three highway segments: ▪ Westbound Long Island Expressway (I-495) near the Queens-Midtown Tunnel (midday) ▪ Approaches to westbound George Washington Bridge on I-95 (midday) ▪ Southbound and northbound FDR Drive between East 10th Street and Brooklyn Bridge (PM)	The Project Sponsors will implement a monitoring plan prior to implementation with post-implementation data collected approximately three months after the start of tolling operations and including thresholds for effects; if the thresholds are reached or crossed, the Project Sponsors will implement Transportation Demand Management (TDM) measures, such as ramp metering, motorist information, signage at all identified highway locations with adverse effects upon implementation of the Project. NYSDOT owns and maintains the relevant segments of the Long Island Expressway and I-95. The relevant segment of the FDR is owned by NYSDOT south of Montgomery Street and NYCDOT north of Montgomery Street. Implementation of TDM measures will be coordinated between the highway owners and the owners of any assets relevant to implementing the TDM. Post-implementation of TDM measures, the Project Sponsors will monitor effects and, if needed, TBTA will modify the toll rates, crossing credits, exemptions, and/or discounts within the parameters of the adopted toll schedule to reduce adverse effects.	Exact timing for data collection will be based on seasonality and other factors such as construction activity in accordance with NYCDOT's traffic count best practices. Modeling to quantify delay will be completed within 60 days of data collection. Baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected approximately three months after the start of tolling operations. If TDM measures are implemented, additional data will be collected within six months after their implementation to determine whether they have addressed the adverse effect.	An increase in average weekday peak period delay of 2.5 minutes or more. The methods of data collection and evaluation will follow standard practices pursuant to guidelines of NYSDOT Highway Design Manual 5.2 and NYSDOT Data Services procedures.	The monitoring plan will be agreed to by the relevant lead and partnering agencies prior to a decision document being issued. TDM measures will be implemented over a period of two to eighteen months after confirming delays in excess of the threshold for next steps. More readily implementable measures (e.g., variable message signs) will be completed first. NYSDOT currently has two TDM projects progressing on the relevant segments of the LIE and the Cross Bronx (I-95) and TDM measures could be coordinated with these projects, as needed. Modifications to toll rates, crossing credits, exemptions, and/or discounts will be made after confirming delays in excess of the threshold for next steps persist following implementation of TDM measures, to allow for analysis of what the modifications should be and public outreach about any changes.	NYSDOT will lead in partnership with TBTA and NYCDOT.
Intersections	Four local intersections in Manhattan: ▪ Trinity Place and Edgar Street (midday) ▪ East 36th Street and Second Avenue (midday) ▪ East 37th Street and Third Avenue (midday) ▪ East 125th Street and Second Avenue (AM, PM)	NYCDOT will monitor those intersections where potential adverse effects were identified and implement appropriate signal timing adjustments to mitigate the effect, per NYCDOT's normal practice.	Exact timing for data collection will be based on seasonality and other factors such as construction activity in accordance with NYCDOT's traffic count best practices. Modeling to quantify delay will be completed within 60 days of data collection. Baseline data will be collected within the six months prior to Project implementation. Post-implementation data will be collected within the six months after Project implementation.	For intersections at LOS E or F pre-implementation, an increase in average intersection delay of greater than five seconds. For intersections at LOS D or better pre-implementation, an increase of intersection delay of greater than five seconds <u>and</u> a worsening of LOS to E or F.	Signal timing adjustments will be made within 90 days of confirming delays in excess of the threshold for next steps.	NYCDOT will lead in partnership with TBTA.
Overall Project Enhancement	Manhattan CBD and other locations in the 28-county region	The Project Sponsors commit to ongoing monitoring and reporting of potential effects on the Project, including for example, traffic entering the CBD, vehicle-miles traveled in the CBD; transit ridership from providers across the region; bus speeds within the CBD; air quality and emissions trends; parking; and Project revenue. Data will be collected in advance and after implementation of the Project. A formal report on the effects of the Project will be issued one year after implementation and then every two years. In addition, a reporting website will make data, analysis, and visualizations available in open data format to the greatest extent practical. Updates will be provided on at least a bi-annual basis as data becomes available and analysis is completed.	Baseline data gathering began in 2019 and will continue through Project implementation as data from external sources becomes available (with some data sets published only annually or quarterly) and data analysis is completed. After Project implementation, these data sets will continue to be collected as they become available and new data sets, such as Project revenue, will start being collected.	N/A – No threshold required; implemented under any adopted tolling structure.	The reporting website will begin reporting baseline data and post-implementation data from the tolling system as soon as practical after Project implementation. A formal report on the effects of the Project will be issued one year after implementation and then every two years. In addition, the reporting website will make data, analysis, and visualizations available in open data format to the greatest extent practical. Updates will be provided on at least a bi-annual basis as data becomes available and analysis is completed.	TBTA will lead in partnership with NYCDOT, NYSDOT, with coordination with other agencies and entities for data as appropriate.

4C. Transit

This subchapter describes the effects of implementing the CBD Tolling Alternative on transit. Analyses of potential effects on traffic conditions, parking, pedestrians, and bicycle usage are presented in other subchapters of Chapter 4, "Transportation." A summary of the affected environment and No Action Alternative conditions and assessment of the environmental consequences of the Project based on the incremental changes in transit ridership between the No Action Alternative and CBD Tolling Alternative is provided below.

4C.1 INTRODUCTION

New York City is home to 8.4 million residents and 4.6 million jobs.[1, 2] The Manhattan CBD is a destination for millions of daily trips and as established in Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling," the vast majority of these trips are made by public transportation. The high-density economic center of Manhattan is connected to the region by transit with a range of modes and service providers, all of which transport millions of workers, residents, and visitors daily to and from the Manhattan CBD. These transit services include local and express subways, commuter and intercity rail, local and express buses, Select Bus Service, intercity buses, ferries, an aerial tramway at Roosevelt Island, and paratransit. Table 4C-1 lists the 10 busiest subway stations, and Table 4C-2 lists the 10 busiest lines by ridership entering the Manhattan CBD. (Figure 4C-1 highlights MTA's service within New York City, and Section 4C.3 provides an overview of regional transit service and operators.)

Transit is the primary mode of travel to the Manhattan CBD; therefore, the continued investment in transit is critical to mobility and accessibility of the Manhattan CBD and the region.[3] Existing funding sources are insufficient to pay for the transit improvement and modernization projects identified in the MTA 2020-2024 Capital Program and subsequent capital programs that are needed for subway, bus, and commuter rail services. The New York State Legislature adopted the MTA Reform and Traffic Mobility Act to provide stable and reliable funding to repair and revitalize the transit system.

To assess the transit system for potential adverse effects as a result of the Project, future conditions with the No Action Alternative and CBD Tolling Alternative were projected using the Best Practice Model (BPM), a regional travel demand model developed and managed by the New York Metropolitan Transportation Council (NYMTC). As described in more detail in Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling," the BPM provides regional transportation demand (including transit ridership) for the AM peak period defined as between 6:00 a.m. and 10:00 a.m. The modeled change or increment between the No Action Alternative and the CBD Tolling Alternative for projected inbound trips toward the Manhattan CBD provide the primary basis for the analysis presented in this subchapter. Section 4C.4.2.2 presents a summary of effects across all tolling scenarios and a determination of the representative tolling

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1 U.S. Census Bureau. American Community Survey, 2015-2019.

2 U.S. Census Bureau, 2012–2016 Census Transportation Planning Package.

3 Chapter 1, "Introduction," provides additional context on the importance of transit to the Manhattan CBD and the region and the need for transit funding, which the Project provides.

scenario with the highest incremental increases in ridership. **Section 4C.2** presents a description of the methodologies used for the assessment of potential adverse effects.

Table 4C-1. Busiest Subway Stations (Annual Total Ridership, 2019)

RANK	STATION/COMPLEX	LINES SERVED	RIDERSHIP
1	Times Sq/42 St/PABT	N, Q, R, W, S; Nos. 1, 2, 3, 7; A, C, E	65,020,294
2	Grand Central – 42 St	S; Nos. 4, 5, 6, 7	45,745,700
3	34 St – Herald Sq	B, D, F, M, N, Q, R, W	39,385,436
4	14 St – Union Sq	L, N, Q, R, W; Nos. 4, 5, 6	32,385,260
5	Fulton St	A, C, J, Z; Nos. 2, 3, 4, 5	27,715,365
6	34 St – Penn Station	Nos. 1, 2, 3	25,967,676
7	34 St – Penn Station	A, C, E	25,631,364
8	59 St – Columbus Circle	A, B, C, D; No. 1	23,040,650
9	Chambers St, WTC/Park Pl/Cortlandt	A, C, E; Nos. 2, 3; R, W	20,820,549
10	Lexington Av-53 St/51 St	E, M; No. 6	18,957,465

Source: MTA
Note: Data is from 2019, the last full year since the onset of the COVID-19 pandemic. Station ridership is the annual total ridership for 2019; PABT = Port Authority Bus Terminal.

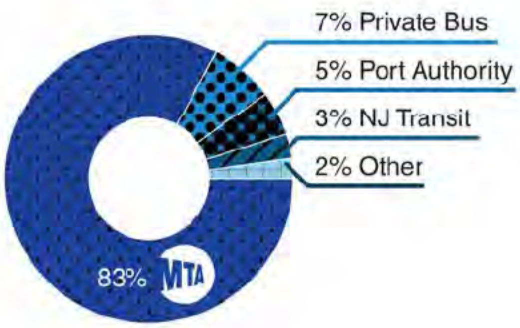
Table 4C-2. Busiest Subway Lines at the Entrance to the Manhattan CBD (2019, AM Peak Period)

RANK	SUBWAY LINE	RIDERSHIP	NO. PEAK-PERIOD SUBWAY TRAINS
1	B, D, N, Q Local	119,435	162
2	Broadway/Seventh Av Express	89,330	125
3	E/M (Queens)	87,258	139
4	Eighth Av Express	84,317	130
5	No. 7 (Queens)	81,066	176
6	N, Q, R (Queens)	67,047	78
7	L	66,760	62
8	Lexington Av Express	63,486	80
9	A, C Local	62,937	65
10	F	48,069	86

Source: WSP, Best Practice Model 2021
Note: Data is from 2019, the last full year since the onset of the COVID-19 pandemic. Ten busiest subway lines are listed based on cordon ridership total per subway line in the AM peak period (6:00 a.m. to 10:00 a.m.).

Figure 4C-1. New York City Transit System Highlights

Transit Trips Entering Manhattan CBD
by operator



Source: NYMTC Hub Bound Travel Data Report, 2019

MTA and its subsidiaries and affiliates provide the bulk of transit trips in the region. They comprise **25** subway lines, over **300** bus routes, and **14** commuter rail routes/ branches.

1.7 Billion Annual Ridership

5.5 Million Average Weekday Subway Ridership

2.2 Million Average Weekday Bus Ridership

6,600+ Subway Cars

472 Stations serving 25 subway lines

24/7 Service

Source: MTA, 2019

While the BPM provides a regionwide basis to estimate demand by all modes of travel over time and from changes to the transportation network, **Section 4C.3** describes existing transit service as documented in NYMTC's *Hub Bound Travel Data Report 2019*, which is the most comprehensive and route-specific data source to describe travel to the Manhattan CBD. Like the BPM used for this EA, the *Hub Bound Travel Data Report 2019* baseline was developed prior to the COVID-19 pandemic, so it represents a reasonable estimate of the No Action Alternative in 2023 as travel demand returns to pre-COVID-19 pandemic levels. However, because the *Hub Bound Travel Data Report 2019* is not directly comparable to the BPM results for the No Action Alternative, this subchapter's analyses of potential effects are based on the BPM results for the Action Alternative compared with BPM results for the No Action Alternative.

Section 4C.4 assesses the incremental change between the No Action Alternative and the CBD Tolling Alternative in 2023.[4] The BPM results for the No Action Alternative were used as the baseline for this analysis because they reflect transit ridership prior to the COVID-19 pandemic that is now beginning to rebuild but is anticipated to remain below the levels modeled in the BPM.

4C.1.1 Traveling To and Within the Manhattan CBD

Nearly 3.9 million commuters enter the Manhattan CBD each day, across a variety of modes including numerous transit operators that are described in **Section 4C.3**.[4] With a long development history that pre-dates the automobile, a multitude of transit options are available. Transit accounts for 75.8 percent of daily trips into the Manhattan CBD (not including walk or bike trips); subway alone accounts for 58 percent of trips.[5] Except for one census tract in Breezy Point, Queens, every other census tract in New York City is within a half mile of at least one transit service. The transit system serving the region and the Manhattan CBD is described in detail in Chapter 4, Section 4.2 (Transit Access to the Manhattan CBD), and it includes subways (MTA), Port Authority Trans-Hudson (PATH), commuter rail, buses, ferries, and tram.

For travel within the Manhattan CBD, there are numerous options other than private automobiles. Indeed, 80 percent of Manhattan CBD residents do not own or have ready access to a vehicle.[6] As noted above, numerous subway and bus routes serve the Manhattan CBD. There is a network of bicycle lanes and a widely available bike-share program, and the Manhattan CBD is very walkable.

Most businesses do not offer on-site, free parking, and curbside parking is limited. Driving from place to place within the Manhattan CBD is not typical except for commercial deliveries. Taxis and for-hire vehicles (FHVs, a category that includes app-based services) provide point-to-point service within the Manhattan CBD and are convenient for trips that would otherwise involve multiple transit routes and modes or a long walk (i.e., crosstown trips between the east and west sides of Manhattan). However, even short taxi or FHVs trips may be costly. Therefore, many people make their longer local trips within the

4 The BPM's long-range 2045 analysis year assessment includes MTA Capital Program projects and projects programmed in the NYMTC Transportation Improvement Program. In light of the scale of those projects relative to line-haul capacity and station configurations, detailed analysis is not provided for the 2045 analysis year. Instead, an overview of incremental change (systemwide boardings) at the 2045 horizon year is provided.

5 New York Metropolitan Transportation Council, *Hub Bound Travel Data Report 2019.*

6 This data is from the CTPP data product based on the 2012–2016 ACS. The CTPP provides custom tables describing residence, workplace, and trips from home to work. The U.S. Census Bureau has not updated the CTPP to reflect more recent American Community Survey data.

Manhattan CBD by subway or bus, and many others travel by bicycle. Walking is the typical choice for shorter trips or even longer trips that involve multiple transit modes or transfers.

4C.2 METHODOLOGY AND ASSUMPTIONS

Information presented in the NYMTC *Hub Bound Travel Data Report 2019*, which summarizes weekday trips entering and exiting the Manhattan CBD by all modes, was used to describe the affected environment. Data for that report was collected in fall 2019 and include full-day and hourly trips. This year is assessed as the final full year before the onset of the COVID-19 pandemic.[7]

The analysis presented compares the forecast difference (or "incremental change") in transit ridership that would occur between the CBD Tolling Alternative and the No Action Alternative. Information on projected ridership for the No Action Alternative and CBD Tolling Alternative was based on the results of the regional transportation modeling conducted for the Project using the BPM.[8] **Subchapter 4A, "Transportation: Regional Transportation Effects and Modeling,"** provides more information on the modeling process and corresponding model results. The analysis in this subchapter considers effects on transit line-haul capacity, which is the capacity of a transit mode at its peak ridership point, and on specific transit stations. These assessments are consistent with the methodologies outlined in the *City Environmental Quality Review (CEQR) Technical Manual*. The *CEQR Technical Manual* recommends a tiered approach in evaluating a project's effects on transit ridership.

4C.2.1 Application of the New York City Environmental Quality Review for Assessment of Transit Effects

New York City agencies use the CEQR process to determine what effect, if any, a discretionary action they approve may have on the environment. The first version of the *CEQR Technical Manual* was published in 1993 and has undergone numerous updates over the years, with the latest edition released at the end of 2021. The *CEQR Technical Manual* discusses methodologies that may be used to analyze specific impact categories. The methodologies have been developed by the expert staffs of various city agencies, working with consultants. CEQR is New York City's process for implementing New York State's Environmental Quality Review Act. It considers the unique characteristics of New York City and establishes evaluation criteria that are suitable for assessing environmental effects in New York City. Most New York City-based NEPA reviews use the available state and local guidance appropriate to evaluate the potential for adverse effects. Since SEQRA has no impact determination criteria for transit, the guidance provided in the *CEQR Technical Manual* provides a means of appropriately examining and disclosing these effects in a dense urban setting.

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7 The study of transportation conditions for purposes of environmental review is normally conducted using stabilized baselines of typical ridership and usage conditions. Although normalcy is slowly being restored, COVID-19 effects on the regional transit system still persist and are expected to remain for some time, likely well into 2024, after the planned implementation of the Project (based on McKinsey analysis for MTA). As such, only the pre-COVID-19 environment can now be considered a valid baseline for study. MTA 2021 Budget and 2021–2024 Financial Plan Adoption Materials. MTA Finance Committee/MTA Board. December 16, 2020. https://new.mta.info/document/25291.

8 BPM assumes public transit fares remain consistent with consumer price index. Due to the importance of transit in the region, ridership is relatively inelastic to fare increases. MTA historical data show real fares (adjusted for inflation) have decreased over time.

4C.2.1.1 USE OF CEQR THRESHOLDS TO TARGET TRANSIT ANALYSES

Based on operating experience from various New York City agencies and the results of extensive numbers of impact assessments conducted on transit facilities, CEQR guidance establishes assessment thresholds whereby detailed analyses are recommended for locations or transit lines where incremental trip generation thresholds are exceeded; if the applicable threshold is not exceeded, no adverse effects are anticipated. The methodologies stipulated in the 2020 *CEQR Technical Manual* are described below.

The methodologies to evaluate line-haul capacity include the following:

- For subways and commuter rail:
  - An increase in ridership on a single subway line that is fewer than 200 new passengers at the maximum load point in the peak hour in a single direction of travel does not have the potential to result in adverse effects.
  - A quantitative analysis of effects on line-haul capacity was performed for any transit services for which the BPM results indicated that the CBD Tolling Alternative would add more new passengers than those thresholds.
  - The next step is to evaluate the number of incremental passengers per train and per train car.
  - If a line remains under its guideline capacity in the future with the CBD Tolling Alternative implemented, the corresponding CBD Tolling Alternative-induced ridership increases would not be considered an adverse effect.
  - If a line is forecasted to operate above guideline capacity and the CBD Tolling Alternative is expected to yield five or more incremental passengers per car, then the ridership increase would constitute an adverse effect.
- For buses:
  - An increase in ridership that is fewer than 50 passengers per hour in a single direction of travel for a bus route does not have the potential to result in adverse effects because such an increase would not be considered perceptible with the level of bus service provided.
  - If the threshold is exceeded, the next step is to evaluate the number of incremental passengers per trip and the volume-to-capacity (v/c) ratio for that bus route.
  - A v/c ratio under 1.00 would not be considered an adverse effect.

The methodologies to evaluate capacity of stations include the following:

- An increase in ridership at a subway station or station complex that is fewer than 200 new passengers in the peak hour does not have the potential to result in adverse effects.
- If a project would result in the addition of 200 or more new passengers at a station in the peak hour (excluding cross-platform transfers), then further analyses could be warranted to assess the potential for adverse effects on station elements such as stairs, escalators, fare collection areas, etc.
- If a station would experience an increase of fewer than 200 peak-hour passengers, further analysis is typically not warranted.

Due to operating characteristics similar to the subway, including hours of operation, headways, boardings, standing capacity, and for consistency, PATH capacity and stations were both evaluated using CEQR criteria. In coordination with Metro-North Railroad (Metro-North) and the LIRR, CEQR methodologies were used to assess ridership of commuter rail lines and stations. This analysis recognizes that five additional passengers within a train car in its most crowded point would be noticeable. Similarly, analyses of stations for the New Jersey Transit Corporation (NJ TRANSIT) and PATH were performed using CEQR guidelines for consistency and because NJ TRANSIT and the Port Authority of New York and New Jersey (PANYNJ) do not have an alternative guideline. The CEQR analysis guidelines were also evaluated for NJ TRANSIT and other suburban buses that enter the Manhattan CBD.

The line haul and station analysis primarily considers the AM peak period based on concentration of ridership. For station element analyses, potential effects in the PM peak hour were also considered to account for differences in circulation and flow within the stations. The BPM only provides forecast trip increments for the four-hour AM peak period, the incremental AM and PM peak-hour trips were estimated, in coordination with New York City Transit (NYCT), by applying reasonable factors to the BPM results.

For any station exceeding the 200-passenger increment threshold, an additional assessment of station characteristics was undertaken to determine if a qualitative assessment would suffice to conclude that the CBD Tolling Alternative would not have potential adverse effects or if more quantitative analyses were warranted. Appendix 4C-5, "Transportation: Supporting Documentation for Transit Analyses" provides more details on the qualitative and quantitative analysis of transit stations, which were developed in consultation with NYCT.

4C.3 AFFECTED ENVIRONMENT

4C.3.1 Regional Transit Environment

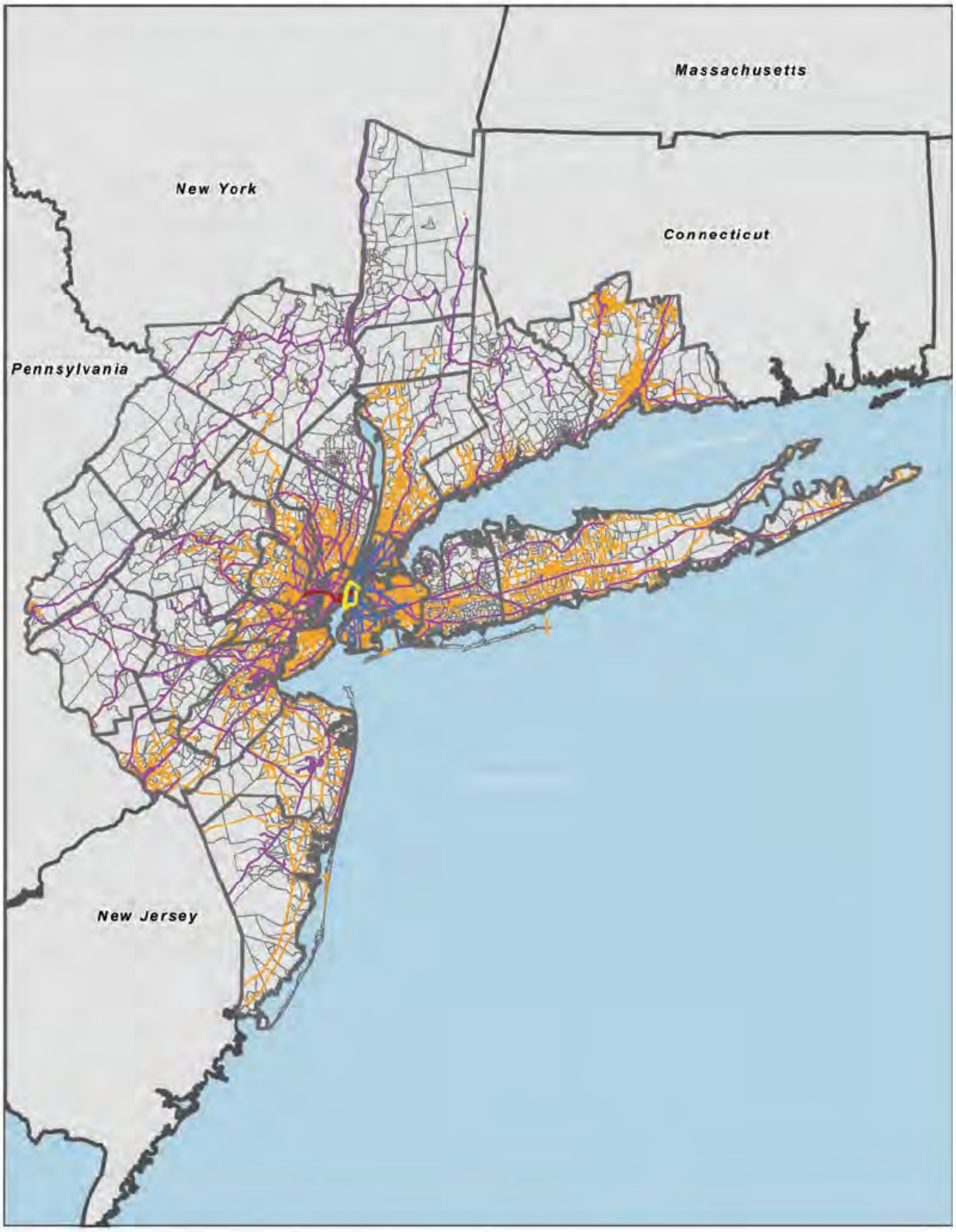
The 28-county study area is rich with transit service (Figure 4C-2). While Section 4C.3.2 focuses on transit options to and from the Manhattan CBD, additional transit options exist throughout the study area. The following is an overview of the regional transit environment.

4C.3.1.1 CONNECTICUT

Much of Connecticut's commuter rail network in Fairfield and New Haven Counties is focused on hub-bound travel; however, the reverse-commute market from New York City to Fairfield County is significant, along with intrastate travel throughout the Metro-North New Haven Line. Branch lines to New Canaan, Danbury, and Waterbury provide additional connections along with the CTrail Hartford Line from New Haven to Hartford.

Local bus services are provided by several operators within (and between) Fairfield and New Haven Counties in Connecticut. Numerous routes connect communities within Connecticut, with concentrations of service in urban areas such as Stamford, Norwalk, Bridgeport, New Haven, and Waterbury. Bus markets between these communities are often distinct from rail markets, particularly where rail branch line services are less frequent or less favorable to intrastate travel.

Figure 4C-2. Transit Services in the 28-County Regional Study Area



Sources: Environmental Services Research Institute (ESRI) 2020, NYC Open Data, MTA, NYSDOT 2021, NJ Geographic Information Network Open Data, NJ TRANSIT 2021, Westchester County, CT Transit 2021.

Note*[s]*:

[1.] Map reflects publicly available datasets only. Additional transit services are available in Nassau, Rockland, and other counties.

[2. For an audio description, please go to the following link: *https://www.youtube.com/watch?v=3laoEmd0a6w&list=PLZHkn788ZQJPEY5zv-dr2gzkzMQFMgb_2&index=1.]*

4C.3.1.2 NEW JERSEY

Commuter rail services in northern New Jersey largely focus on New York-bound travel; however, intrastate ridership is significant and serves a variety of urban areas and activity centers including Newark, Hoboken, Trenton, and Metropark, among others. The NJ TRANSIT rail network is heavily integrated with local and regional bus networks, light rail, PATH, and ferries, supporting reverse-commute activity from New York City as well.

Local and regional bus service is prevalent throughout northern New Jersey with concentrations in major urban areas such as Hudson County and New Jersey's largest cities, including Newark, Paterson, Jersey City, and Elizabeth. NJ TRANSIT operates most local bus service, complemented by some contract and private carrier routes, along with county and municipal operations, including paratransit, senior, and human services transportation. Private jitney services are also prevalent in Hudson, Bergen, and Passaic Counties, serving both local and interstate customers.

4C.3.1.3 NEW YORK

Commuter rail in Nassau, Suffolk, Rockland, Orange, Dutchess, Putnam, and Westchester Counties is largely focused on travel to New York City. Each east-of-Hudson line is used for intercounty and intracounty travel and for reverse-commute travel from New York City to major employment centers such as White Plains and Stamford, Connecticut.

Extensive local bus networks exist in New York counties adjacent to New York City, notably the Bee-Line and Nassau Inter-County Express (NICE) bus networks in Westchester and Nassau Counties, respectively. Bus transit is also prevalent throughout the region in counties such as Suffolk, Dutchess, Putnam, Orange, and Rockland.

Bee-Line bus service focuses on the suburban and urban portions of southern Westchester County, with hubs in White Plains, Yonkers, Mount Vernon, and New Rochelle. Bee-Line routes connect a wide array of communities and offer multimodal connections to commuter rail, subway, and regional bus services.

Nassau County buses connect communities and activity centers with hubs including (but not limited to) Hempstead, Great Neck, Mineola, and Hicksville. Many hubs include intermodal connections at commuter rail stations, while some routes also serve the Jamaica hub in Queens. Connections are also available to Suffolk County buses in Hicksville. Other New York county bus systems are smaller in scale but offer similar functionality.

While many routes provide multimodal connections at commuter rail stations (and some subway stations), a significant focus of these networks is intracounty travel. Each bus system offers opportunities to transfer to New York City-bound transit or travel within the counties between activity and population centers.

4C.3.1.4 NEW YORK CITY

As previously stated, a multitude of transit options exist within New York City, though the New York City subway is the primary commute option. There are almost three times as many subway riders as bus riders according to pre-COVID-19 pandemic data (approximately 5.5 million average weekday subway riders versus 2.2 million average weekday bus riders).

As the most convenient and affordable means of travel for most New Yorkers, commuters are unlikely to change modes if the subway or station they regularly use is crowded periodically. They may need to wait for the next train, which is typically 5 to 15 minutes away. Moreover, the availability of express and local services throughout the system provides duplicity of service along lines into the Manhattan CBD such that additional capacity is available, especially during peak periods.

4C.3.2 Summary of Transit Service by Provider

4C.3.2.1 DESCRIPTION OF TRANSIT OPERATORS AND SERVICES

The transit modes and services available to the Manhattan CBD are illustrated on **Figure 4C-3**. The transit system serving the region and the Manhattan CBD is described in detail in Chapter 4, Section 4.2 (Transit Access to the Manhattan CBD), and it includes subways (MTA), PATH, commuter rail, buses, ferries, and tram.

Each of the operators highlighted within **Figure 4C-3** is listed or described below. Consistent with *Hub Bound Travel Data Report 2019* data, which serve as the basis for existing conditions, the following service level estimates reference 2019 data to reflect pre-COVID-19 pandemic conditions:

- **MTA:** MTA and its subsidiaries and affiliates—LIRR, Metro-North, NYCT, and MTA Bus—provide the bulk of transit trips to the Manhattan CBD. The New York City subway system is the single largest transit provider.
  - **MTA subway.** The New York City subway is the most widely used transit mode for access to the Manhattan CBD by residents of New York City.[9] There are 25 individual subway routes that cross into the Manhattan CBD, carrying about 1.35 million AM peak-period riders in and out of the Manhattan CBD on a typical weekday.

[9] The subway does not provide access to the Manhattan CBD from Staten Island. The Staten Island Railway (**Figure 4C-3**) provides rapid-transit within the island.

Figure 4C-3. Transit Routes to/from the Manhattan CBD (2019)

Notes: Private bus operators connect commuters to various locations within the Manhattan CBD; those routes are not displayed here.
* Operated by Academy Bus

Manhattan CBD (Excluding West Side Highway/Route 9A and FDR Drive)

Transit by Sector

Source: NYMTC *Hub Bound Travel Data Report 2019*

- **MTA buses.** NYCT and MTA Bus[10] operate an array of local and express buses and Select Bus Service within New York City (Bus maps for each borough are available in **Appendix 4C-1** and at https://new.mta.info/maps). NYCT operates 234 local, 73 express, and 20 Select Bus Service routes, while MTA Bus operates another 90 express, 44 local, and 3 Select Bus Service routes. From the public's perspective, the two operators are nearly indistinguishable. Therefore, this subchapter refers to the combined services as "MTA buses." MTA buses provide local services into and out of the Manhattan CBD largely at 60th Street as well as local and express bus services from outer boroughs. Local service across the 60th Street boundary consists predominantly of Manhattan-based local services running north/south, serving the Upper East Side, Upper West Side, Harlem, Washington Heights, and Inwood. Local services are also provided to and from Queens via the Ed Koch Queensboro Bridge and to and from Brooklyn via the Williamsburg Bridge. Express bus routes connect the Manhattan CBD with the Bronx, Brooklyn, Queens, and Staten Island. These express bus routes tend to serve areas with fewer or no direct subway connections to the Manhattan CBD. MTA buses carry about 42,245 passengers across the boundary of the Manhattan CBD during the AM peak period on a typical weekday.[11]
- MTA commuter rail:
  - LIRR runs commuter rail services to Long Island with service to and from Penn Station New York and service to Atlantic Terminal in Brooklyn, as well as Jamaica, Hunters Point Avenue, and Long Island City in Queens, where passengers can connect with subways or ferries to Manhattan. (The East Side Access project brings LIRR service into Grand Central Terminal, ***[and opened in December]*** 2022). LIRR serves 124 stations across its 11 branches: Montauk, Port Jefferson, Ronkonkoma, Babylon, West Hempstead, Long Beach, Hempstead, Oyster Bay, Far Rockaway, Port Washington, and the Main Line. These branches include 10 stops within the City Terminal Zone (1 in Manhattan at Penn Station New York; 3 in Brooklyn; 6 in Queens[12]). On a typical weekday, more than 89,000 riders cross into the Manhattan CBD via LIRR during the AM peak period. (The LIRR system map is available in **Appendix 4C-1**).
  - Metro-North provides commuter rail service for Westchester, Putnam, and Dutchess Counties in New York State (east of Hudson), Rockland and Orange Counties in New York State (west of Hudson) and Fairfield and New Haven Counties in Connecticut. Three east-of-Hudson lines terminate at Grand Central Terminal: the Hudson, Harlem, and New Haven lines. (The Penn Station Access project will connect Penn Station New York with the New Haven line, among other improvements. It is expected to take 63 months to complete). These three lines on a typical weekday carry about 85,000 passengers across the Manhattan CBD during the AM peak period.
  - NJ TRANSIT operates west-of-Hudson services (Port Jervis and Pascack Valley Lines) under contract to and from Hoboken Terminal in New Jersey and are considered part of the New Jersey sector for this analysis. West-of-Hudson travel to Penn Station New York is possible via

10 The Manhattan and Bronx Surface Transit Operating Authority, as a subsidiary of NYCT, is also included in these numbers.
11 Because data was collected in 2019, ongoing MTA NYCT bus network redesign projects for each borough have not been incorporated into the affected environment description.
12 Mets-Willets Point Station in Queens operates only for special-event service.

a transfer to NJ TRANSIT rail in Secaucus, New Jersey.[13] (The Metro-North system map is provided in Appendix 4C-1).

- PANYNJ: PANYNJ operates commuter rail transit service between New York City and New Jersey via the PATH trains (service map available in Appendix 4C-1).[14] The routes originate from Hoboken, Jersey City, and Newark with New York City terminals at the World Trade Center and West 33rd Street. PATH service in Manhattan includes one train stop in Lower Manhattan and four stops between Greenwich Village and Midtown. PATH service has an AM peak-period ridership of about 100,000 passengers on a typical weekday. PATH ridership into the Manhattan CBD also includes NJ TRANSIT, Newark Light Rail, and Hudson-Bergen Light Rail customers who transfer to PATH in Newark, Jersey City, and Hoboken.

  PANYNJ also owns and operates the PABT at West 42nd Street and Eighth Avenue, as well as the George Washington Bridge Bus Station (GWBBS) at Broadway between West 178th and West 179th Streets, but it does not operate any of the bus services to and from these locations. Many New Jersey bus passengers transfer at the GWBBS to the New York City subway system to travel to the Manhattan CBD.

- NJ TRANSIT: NJ TRANSIT operates commuter rail and bus services into and out of the Manhattan CBD. Five NJ TRANSIT rail lines provide direct service to Penn Station New York. (The other NJ TRANSIT rail lines provide transfers to Penn Station New York at Newark and Secaucus, New Jersey, or to other destinations in the Manhattan CBD via PATH or ferries from Hoboken, New Jersey.) The NJ TRANSIT commuter rail system map is available in Appendix 4C-1.

  Numerous NJ TRANSIT bus routes serve Manhattan via the Lincoln Tunnel to the PABT. NJ TRANSIT also runs one bus route to Lower Manhattan via the Holland Tunnel. Some NJ TRANSIT bus routes serve the GWBBS in Upper Manhattan, where most passengers transfer to the A subway line (or No. 1 subway line several blocks away) to reach the Manhattan CBD. On a typical weekday, NJ TRANSIT commuter rail serves about 68,133 passengers while its bus operations carry about 148,364 passengers during the AM peak period.

  NJ TRANSIT also owns and operates the Hudson-Bergen Light Rail, which connects the communities of Bayonne, Jersey City, Hoboken, Weehawken, Union City, and North Bergen, Newark Light Rail, and the River Line, connecting Trenton and Camden, New Jersey. Hudson-Bergen Light Rail provides a transfer point to NJ TRANSIT rail, bus, PATH, and ferry services at Hoboken.

- Private Bus Operators: Various private bus operators serve the PABT, GWBBS, and on-street locations in the Manhattan CBD from origins in New Jersey, southern New York (west of the Hudson River), and eastern Pennsylvania. Private jitney buses operate from Hudson, Bergen, and Passaic Counties in New Jersey to the Manhattan CBD at the PABT and on-street around the bus terminal. Hampton Jitney operates daily bus service between eastern Long Island, New York and the Manhattan CBD as well as Upper Manhattan, using on-street stops in the Manhattan CBD. Additional long-distance bus operators such as Megabus, Peter Pan Bus, and Greyhound[15] also commission routes serving these corridors. Of

13 Metro-North west-of-Hudson transfers constitute a small percentage of all west-of-Hudson transit trips routes.
14 Although PATH is Federally classified as a commuter rail system, based on headways, stations, and boardings, and consistent with the NYMTC *Hub Bound Travel Data Report 2019*, it has been categorized as a subway system for this analysis.
15 Greyhound also operates a commuter service to New York from a park-and-ride facility in southern New Jersey.

the private operators that participated in the 2015 PABT/GWBBS Continuous Bus Survey, 40 percent provided commuter service (defined through measures of distance and bus frequency), and all private operators collectively provided 27 percent—about 20,000 passengers—of AM peak-hour inbound PABT trips on a typical weekday.[16]

- **Amtrak:** Amtrak provides intercity rail service between Penn Station New York and destinations nationwide.[17] Amtrak's Northeast Corridor directly links Penn Station New York with Boston to the north, Washington, D.C., to the south, and key cities in between. The Empire Corridor links New York City with Albany and points west toward Buffalo, with the bulk of service provided between New York City and Albany. While Amtrak primarily serves long-distance travelers, some commuters also use these services as an alternative to commuter rail services provided by Metro-North or NJ TRANSIT. On a typical weekday, AM peak-period ridership on Amtrak in and out of Penn Station New York is about 6,700 passengers.
- **NICE:** NICE bus is the local bus system serving Nassau County and connecting passengers with western Suffolk County and Queens. It serves 48 MTA LIRR stations and 5 MTA NYCT subway stations that provide connectivity to the Manhattan CBD. (There is no NICE service directly to the Manhattan CBD.) Notable transfer points include but are not limited to Jamaica Center, 179th Street-Flushing, Far Rockaway (to MTA buses); Flushing, Jamaica, Far Rockaway (to NYCT subways); and Mineola Intermodal Transfer Center, Hicksville, Freeport, and Great Neck (to LIRR commuter rail). Prior to the COVID-19 pandemic, daily ridership of NICE service exceeded 100,000.[18]
- **Westchester County Department of Transportation/Bee-Line:** Westchester County's Bee-Line bus system operates a weekday-only direct express bus service from several suburban communities to the Manhattan CBD via 11 round trips each weekday, serving about 160 passengers in the AM peak period on a typical weekday. Bee-Line also provides connecting local bus services to NYCT subway service in the Bronx.
- **NYCDOT Staten Island Ferry:** NYCDOT provides free ferry service between Lower Manhattan and Staten Island via the Staten Island Ferry, with AM peak-period ridership of 19,866 inbound and outbound passengers on a typical weekday.
- **NYC Ferry:** The New York City Economic Development Corporation operates several NYC Ferry routes, which were originally introduced in 2017. As of 2019, these routes provide service between Manhattan, the Bronx, Brooklyn, and Queens. Expansion of this service in 2021 included a new route between Staten Island, Battery Park City, and Midtown at West 39th Street. A new route is planned between Wall Street/Pier 11 and Coney Island in Brooklyn, along with other route extensions and new stops. As

16 2015 PABT/GWBBS Continuous Bus Survey, which was prepared for the PANYNJ by VHB.
17 Amtrak is categorized as suburban rail (here, commuter rail) in the NYMTC *Hub Bound Travel Data Report 2019* and is therefore described under Section 4C.2. Because these travelers are such a small proportion of Manhattan CBD commuters, they are not noted within Section 4C.3.
18 LongIsland.com. 2019. "Nassau Inter-County Express (NICE)." https://www.longisland.com/business/nassau-inter-county-express-nice.html.

of fall 2019,[19] average daily ridership during peak months across all NYC Ferry routes (inbound and outbound) was about 23,000 passengers.[20]

- **Other Private Ferry Services:** Other ferry operators provide service to and from the Manhattan CBD. With the exception of New York Water Taxi, all providers offer routes between Manhattan and New Jersey. The New York Water Taxi operates around Lower Manhattan and Brooklyn. New York Water Taxi destinations include the South Street Seaport, Battery Park, and Midtown Manhattan, along with the DUMBO neighborhood in Brooklyn.

  Other operators include New York Waterway, Seastreak, and Liberty Landing Ferry. New York Water Taxi operates mostly as a tour operation, except for the IKEA route to and from Brooklyn. The New York Waterway ferry alone provides service to about 32,000 passengers on a typical weekday (inbound and outbound).[21]

- **Roosevelt Island Tramway:** The Roosevelt Island Tramway serves as a direct connection between Roosevelt Island and the rest of Manhattan via an aerial tram directly to the north of the Ed Koch Queensboro Bridge. (Access between Roosevelt Island and the Manhattan CBD is also provided by a stop on the F subway line, and the Roosevelt Island stop on the East River ferry line.) The tramway carries 859 passengers in the AM peak period into the Manhattan CBD on a typical weekday.

4C.3.2.2 RIDERSHIP DISTRIBUTION

Table 4C-3 presents the NYMTC *Hub Bound Travel Data Report 2019* daily weekday ridership[22] estimates by key transit service providers to the Manhattan CBD, as well as total trips by service provider.

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19 2019 data for comparison to NYMTC *Hub Bound Travel Data Report 2019* of the same year.

20 New York City Economic Development Corporation. 2018. *NYC Ferry Quarterly Update 7/1/17 - 9/30/17.* September 17. https://images.ferry.nyc/wp-content/uploads/2018/09/13143041/NYC-Ferry-2017-Q3-Quarterly-Update.pdf. NYC Ferry data is collected and published quarterly; this report includes ridership statistics from July through September 2019.

21 AMNY. 2019. "Coast Guard suspends New York Waterway ferries over safety issues." https://www.amny.com/transportation/coast-guard-suspends-ny-waterway-ferries-over-safety-issues/.

22 NYMTC *Hub Bound Travel Data Report 2019* presents person-trips into the Manhattan CBD, which is equivalent to the ridership at that location; the BPM similarly measures passenger load at a location unless otherwise noted.

Table 4C-3. Transit Ridership to and from the Manhattan CBD by Service Provider (AM Peak Period) (2019)

SERVICE PROVIDER	INBOUND PERSON-TRIPS		TOTAL PERSON-TRIPS[3]	
	Number of Trips	Percentage of Trips	Number of Trips	Percentage of Trips
Subway				
New York City Transit	962,665	91.9%	1,257,761	92.6%
Port Authority Trans-Hudson (PATH)	84,317	8.1%	100,515	7.4%
TOTAL	**1,046,982**	**100.0%**	**1,358,276**	**100.0%**
Commuter and Intercity Rail				
Long Island Rail Road	84,580	37.2%	89,500	35.8%
Metro-North Railroad	79,154	34.8%	85,582	34.2%
West of Hudson/NJ TRANSIT	60,295	26.5%	68,133	27.3%
Amtrak[2]	3,361	1.5%	6,711	2.7%
TOTAL	**227,390**	**100.0%**	**249,926**	**100.0%**
Buses				
New Jersey[1]	116,186	76.0%	148,364	77.8%
New York City Transit/MTA Bus	36,501	23.9%	42,245	22.1%
Westchester County DOT/Bee-Line	160	0.1%	160	0.0%
TOTAL	**152,847**	**100.0%**	**190,769**	**100.0%**
Ferries/Tramway[4]				
Staten Island Ferry	**16,881**	**49.2%**	**20,028**	**51.1%**
Roosevelt Island Tramway/Other Ferry	**17,430**	**50.8%**	**19,143**	**48.9%**
TOTAL	**34,311**	**100.0%**	**39,171**	**100.0%**

Source: NYMTC *Hub Bound Travel Data Report 2019.*

1 New Jersey bus trips include NJ TRANSIT, MTA buses via Staten Island, and private carriers.

2 Amtrak is classified under "commuter rail" for existing conditions data, consistent with the *Hub Bound Travel Data Report 2019* classification.

3 Total includes inbound and outbound person-trips.

4 The *Hub Bound Travel Data Report 2019* does not present operator data for ferry/tramway. All ferry trips from Staten Island can be assumed to be via Staten Island Ferry because this was the only transit service operating to the Manhattan CBD from Staten Island in 2019. The ferry number presented above contains cyclists aboard the ferry.

4C.3.3 Transit Ridership Overview

As summarized in **Table 4C-4**, approximately 75.2 percent of the more than 7 million daily person-trips into and out of the Manhattan CBD are made using transit (because transit accessibility is critical for low income commuters, **Chapter 17, "Environmental Justice,"** provides an additional detailed assessment of transit ridership by income).[23] Based on the *Hub Bound Travel Data Report 2019*, the majority of these transit trips (57.5 percent of all trips into and out of the Manhattan CBD) are by subway. Commuter rail also serves a substantial proportion of trips made to the Manhattan CBD, followed by bus service. The proportion of transit trips is highest during the AM peak period, when 83.3 percent of trips are made via transit (**Table 4C-5**), which is why the analyses in this subchapter were conducted for the AM peak period. The AM peak period has the highest concentration of person- and vehicle-trips under baseline conditions and is typically used for assessing the effects of large-scale regional transportation projects.

In total, MTA bus services account for approximately 1.6 percent of all trips into and out of the Manhattan CBD. NJ TRANSIT bus service carries about 5.3 percent of all trips. Other private bus carriers (such as Greyhound, Coach USA, Academy, DeCamp, and Lakeland) with service to the PABT and on-street in Manhattan account for less than 1 percent of all trips into and out of the Manhattan CBD. The remaining 1.7 percent of Manhattan CBD transit trips are by ferry service (provided primarily by the Staten Island Ferry along with NYC Ferry, and private ferry companies) and the Roosevelt Island Tramway.

Table 4C-4. Daily Person-Trips by Mode to and from the Manhattan CBD on an Average Weekday (2019)

MODE	NUMBER OF PERSON-TRIPS	PERCENTAGE OF TOTAL
Transit		
Subway	4,398,284	57.5%
Commuter and Intercity Rail	685,330	9.0%
Buses	532,307	7.0%
Ferries	126,425	1.7%
Tramway	5,516	0.1%
Subtotal	5,747,862	75.2%
Non-Transit		
Auto/Taxi/Truck/Van	1,835,842	24.0%
Bicycle	65,588	0.8%
TOTAL	**7,649,292**	**100.0%**

Source: NYMTC *Hub Bound Travel Data Report 2019.*
Note: Data includes inbound and outbound trips. Staten Island Ferry person-trips include onboard bicyclists.

[23] For purposes of describing the share of Manhattan CBD-bound trips that are made using transit, bicycle and pedestrian trips were not included. On an average weekday about 67,000 bicycle trips (less than 1 percent) enter the Manhattan CBD daily (per the *Hub Bound Travel Data Report 2019*). Pedestrian trips are not included in the *Hub Bound Travel Data Report 2019*.

Table 4C-5. AM Peak-Period Person-Trips to and from the Manhattan CBD by Mode on an Average Weekday (2019)

MODE	NUMBER OF PERSON-TRIPS	PERCENTAGE OF TOTAL
Transit		
Subway	1,358,276	61.6%
Commuter and Intercity Rail	249,926	11.3%
Buses	190,769	8.7%
Ferries	38,084	1.7%
Tramway	1,087	0.1%
Subtotal	1,838,142	83.3%
Non-Transit		
Auto/Taxi/Truck/Van	356,022	16.1%
Bicycle	12,862	0.6%
TOTAL	**2,207,026**	**100.0%**

Source: NYMTC *Hub Bound Travel Data Report 2019.*
Note: Data includes inbound and outbound trips. Staten Island Ferry person-trips do include count of onboard bicycles.

4C.3.4 Existing Volumes Entering the Manhattan CBD (2019)

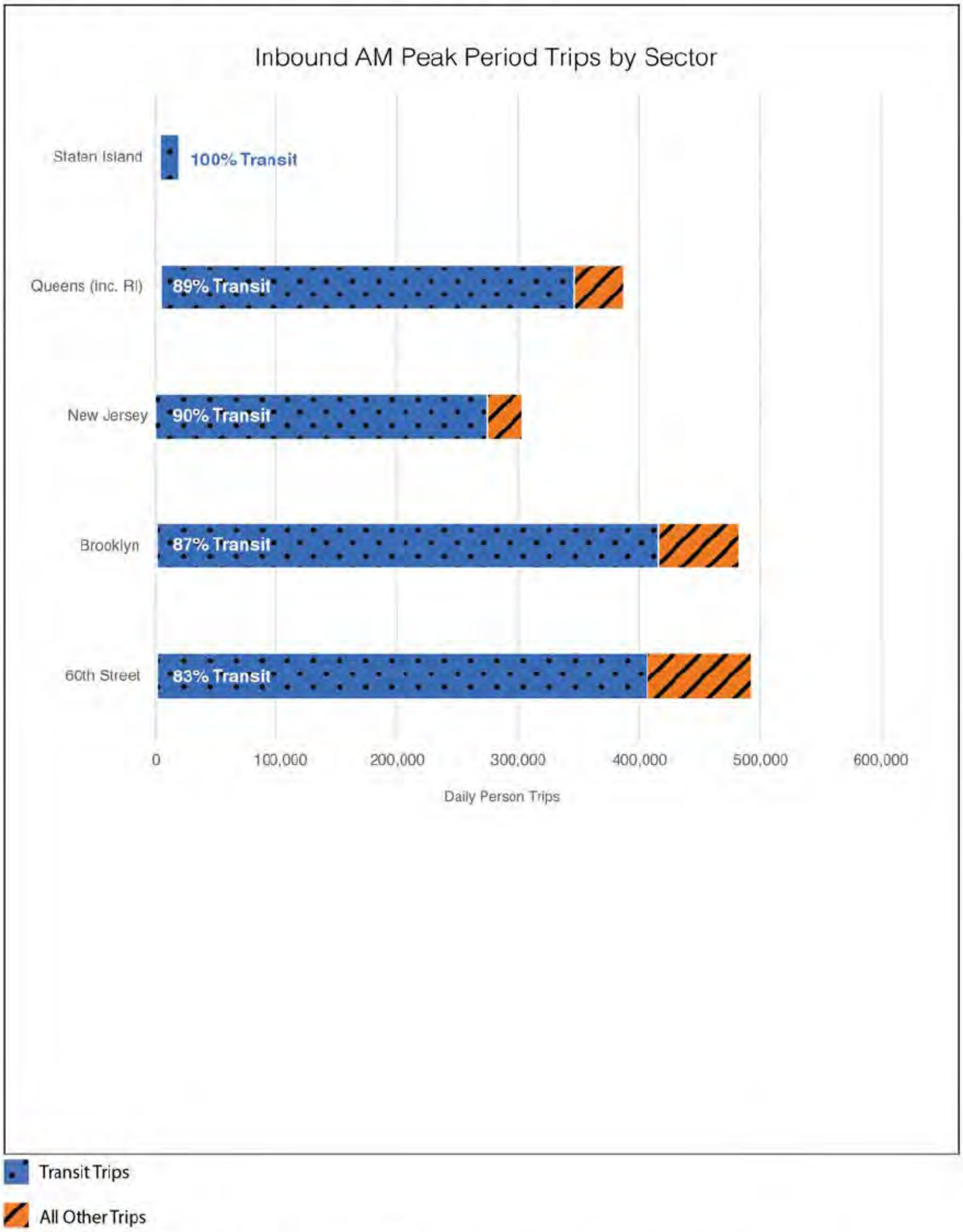
This section briefly describes existing (2019) transit ridership for trips into and out of the Manhattan CBD from the five geographic sectors that the *NYMTC Hub Bound Travel Data Report* uses to organize trips. These are defined according to entry and exit from the Manhattan CBD: Manhattan north of 60th Street, Queens, Brooklyn, Staten Island, and New Jersey/west of Hudson.[24] **Figure 4C-4** shows the distribution and mode of all transit crossings (in relation to the total trips).

As shown on **Figure 4C-4** and **Figure 4C-5**, the Manhattan – 60th Street sector carries the most total trips as well as the second-most transit trips of the five sectors. Even so, with 83 percent of trips from this sector made by transit, the Manhattan/60th Street sector has a lower proportion of its total trips made by transit than Queens (89 percent), New Jersey (90 percent), and Brooklyn (87 percent).[25]

[24] The boundary of the Manhattan CBD according to the *Hub Bound Travel Data Report* consists of 60th Street (including at the Franklin D. Roosevelt [FDR] Drive and West Side Highway/Route 9A), the East and Hudson Rivers, and New York Harbor. This boundary generally matches the boundaries defined for the Manhattan CBD, except that the Manhattan CBD does not include the FDR Drive and the West Side Highway/Route 9A.

[25] While the Ed Koch Queensboro Bridge ramps were considered as within the 60th Street sector (for autos/trucks/taxi trips), bus trips over the bridge as analyzed in this subchapter were considered within the Queens sector. Similarly, the F subway line entering from Roosevelt Island/Queens was categorized as coming from the Queens sector, although the subway tunnel actually crosses the 60th Street cordon line.

Figure 4C-4. Inbound AM Peak-Period Trips by Sector



Source: NYMTC *Hub Bound Travel Data Report 2019.*

Note: The *Hub Bound Travel Data Report 2019* does not provide vehicle data for Staten Island because vehicles arrive to the Manhattan CBD via Brooklyn or New Jersey; similarly Staten Island trips on express buses that run through New Jersey and Brooklyn without stopping there, as well as bus-to-subway transfers in Brooklyn, are counted in those sectors. Therefore the only direct trips shown for this table are transit trips via Staten Island ferry.